

The Field Museum

1893-1993

1993 Report to the Board of Trustees



Center for Evolutionary and Environmental Biology
&
Center for Cultural Understanding and Change

photographs and illustrations:

Cover: NASA photograph of the earth with background design based on the leaf of *Monstera* sp. photographed in Costa Rica by W. Burger (Botany). Design by C. Simpson.

Center for Evolutionary and Environmental Biology title page: Reconstruction of the early fossil carnivore *Vulpavus profectus* on *Platanus* (a sycamore). This animal dates from about 50 million years B.P. and lies near the base of the carnivore evolutionary tree. *Vulpavus* is an ancient relative of the living 'dog-like' carnivores (dogs, bears, weasels) and is described by J. Flynn (Geology) in a forthcoming paper on Early Cenozoic Carnivora. Illustration by M. Donnelly.

Center for Cultural Understanding and Change title page: Pictograph depicting figure interpreted as 'Batwoman' at the site of 'Batwoman House' in Dowozhiebito Canyon in northern Arizona. This was a household marker in a large Kayenta Anasazi cliff-dwelling occupied from 1250 to 1300 A.D. and studied by J. Haas and W. Creamer (Anthropology). Illustration is reproduced from J. Haas and W. Creamer: Stress and Warfare among the Kayenta Anasazi of the Thirteenth Century A.D. *Fieldiana Anthropology n.s.*, 21:1-211 (1993). Illustration by B. Hammond.

Academic Affairs Services title page: Field Museum scanning electron microscope facility used by staff and students for studying the external form and surface of small three-dimensional specimens. The scanning electron microscope facility was generously funded by the Elizabeth F. Cheney Foundation and the National Science Foundation. Photograph by J. Weinstein, neg. #GN86054.

THE FIELD MUSEUM

CENTER FOR EVOLUTIONARY AND ENVIRONMENTAL BIOLOGY (CEEB)

&

CENTER FOR CULTURAL UNDERSTANDING AND CHANGE (CCUC)

1993 - Annual Report to the Board of Trustees

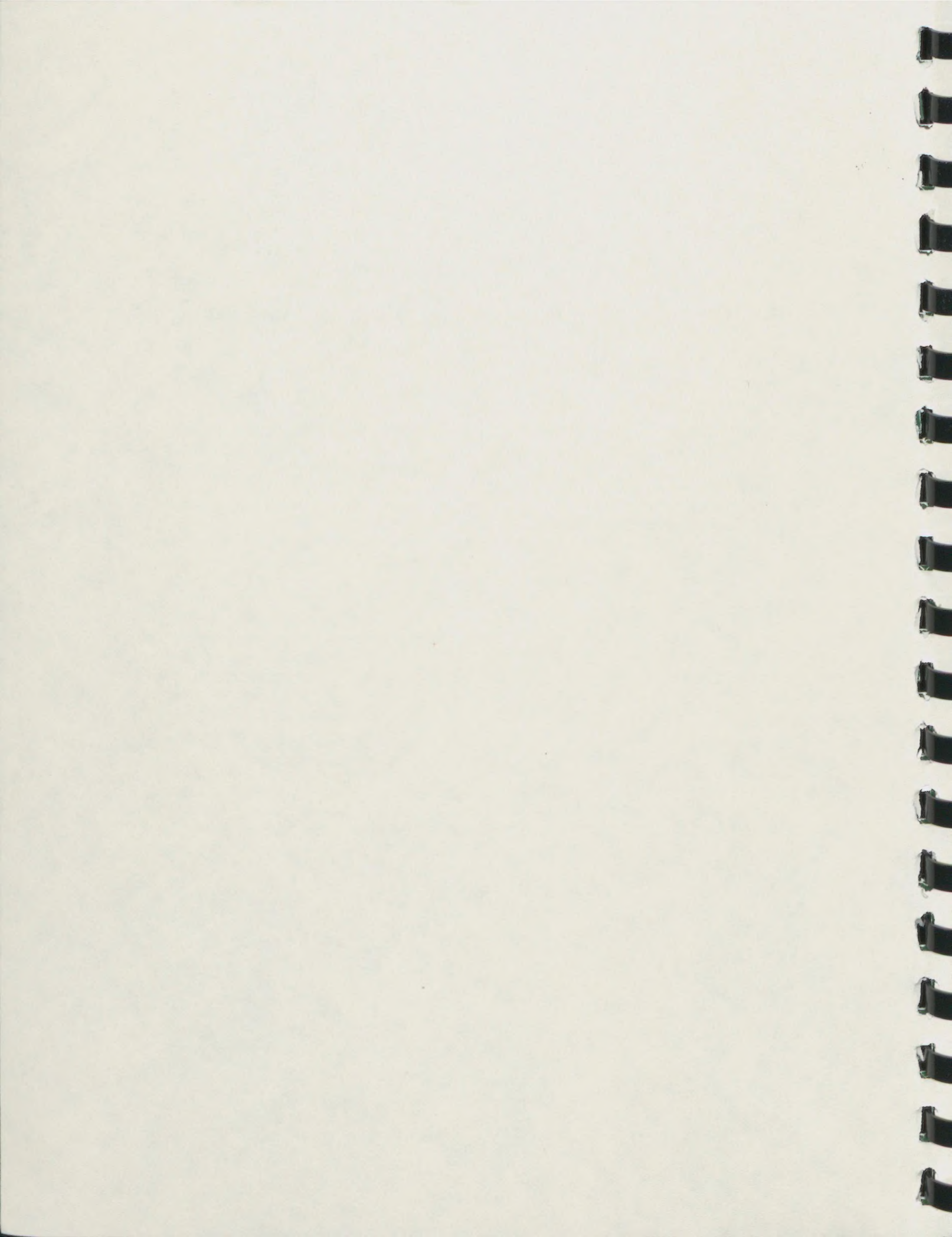
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- This Report Printed on Recycled Paper -

February 21, 1994



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FOREWORD

- LIVING TOGETHER ON THE LIVING EARTH -

Peter R. Crane
Vice President, Academic Affairs
and
MacArthur Curator

In 1993 the Field Museum embarked on its Centennial celebrating the achievements of the past but focusing on the future. Understanding our responsibility to match the vision of our Founders, in 1992 we initiated an ambitious program of strategic planning to set a course that would sustain us into the next century. One result of this planning has been a new mission statement that articulates a vision of a unique institution of public learning concerned with diversity and interconnections, both in nature and among cultures. Another result has been the creation of two interdisciplinary Centers—The Center for Evolutionary and Environmental Biology and the Center for Cultural Understanding and Change—to provide the unifying intellectual curriculum for all Museum programs. These Centers cut across the four academic departments of Anthropology, Botany, Geology and Zoology and focus the entire Museum around two areas of great societal concern.

This report documents what was achieved by the Centers in 1993 through the extraordinary dedication of the staff and the outstanding commitment of our supporters. These accomplishments point the way for future progress and still greater success.

STAFF LIST

(as of February 21, 1994)

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THE FIELD MUSEUM - MISSION STATEMENT

Preamble: *Serving The Public As Educator*

The Field Museum is an educational institution concerned with the diversity and relationships in nature and among cultures. It provides collection-based research and learning for greater public understanding and appreciation of the world in which we live. Its collections, public learning programs, and research are inseparably linked to serve a diverse public of varied ages, backgrounds and knowledge.

Subject Matter Focus: *Living Together On The Living Earth*

Combining the fields of Anthropology, Botany, Geology, Paleontology and Zoology, the Museum uses an interdisciplinary approach to increasing knowledge about the past, present and future of the physical earth, its plants, animals, people, and their cultures. In doing so, it seeks to uncover the extent and character of biological and cultural diversity, similarities and interdependencies so that we may better understand, respect, and celebrate nature and other people.

Collections: *World-Wide Knowledge Database*

The Museum holds encyclopedic collections of biological and geological specimens and cultural objects as the data needed to understand the nature of — and conditions affecting — environmental and cultural change. In support of these collections, we also hold significant collections of books, periodicals, photographs, illustrations, computer data, archival and instructional material. Like a great research library, our collections of more than 20 million items are a crucial part of the world's knowledge database for the sciences, humanities and the arts. The Museum holds the collections in trust for future generations. Over time, new knowledge is gleaned from the collections. Accordingly, the Museum must manage the collections to provide for both long-term conservation and access and make strategic additions to the collections pursuant to clearly defined objectives. In discharging its collection trusteeship, the Museum recognizes the special relationship it has with the people whose cultures and habitats are represented in the collections. We will nurture these special relationships so together we can enhance greater understanding of cultural traditions and environmental surroundings for the benefit of all humankind.

Public Learning: *Offering Greater Understanding About Environments And People*

Unlike schooling, learning in a museum is self-motivated, self-directed, and can be lifelong. Unlike print and electronic media, information is communicated primarily through real, tangible objects. Museum learning usually takes place during leisure time and without the direction of a teacher. The exhibit is the principal avenue of learning. Exhibits are augmented by people mediated programs and a visitor-oriented museum-wide staff which reaches out to assist all visitors. Services to schools and communities extend the museum experience to people beyond our walls. To stimulate a public sense of inquiry, curiosity and delight, our exhibits and programs are not only informative, but also entertaining and inspiring. We focus on critical environmental and cultural issues which are engaging and relevant to the public's daily lives and civic responsibilities. We must be a vital educational and recreational destination for both our local and world-wide communities.

Research: Explaining The Patterns And Processes That Shape The Living Earth

The Museum maintains a vital program of basic research that continually stimulates active and pioneering uses of the collections. Seeking new knowledge and deriving new syntheses about the dynamic physical, biological and cultural patterns and processes that shape the living earth, Museum research centers on anthropology and the natural sciences of evolutionary and environmental biology and geology. All of the research programs are focused on the interrelationships among the earth, its environments, life and cultures and how they change over time. Our research methods use advanced technologies and encourage an interdisciplinary approach which combines the Museum's disciplinary breadth and small research staff into a uniquely imaginative and focused whole. Our basic research has direct linkages to research about conservational, ecological, biomedical and multicultural issues. The Museum and its staff communicate our research findings and ideas about the history of the planet by means of scholarly and general papers, oral presentations to scientific and public audiences, public exhibits and other learning programs.

Publics: Reaching Out

Field Museum serves diverse publics ranging from children, adults and families to the national and international research community. We reach out to our diverse publics and their changing educational needs. We have a special responsibility to reach out to the people of Chicago, neighboring communities and the State of Illinois. Our visitors should reflect the cultural, educational and economic diversity of the Chicago metropolitan area. We must work collaboratively and sensitively with the people in our locality, country and world whose cultures and habitats are represented in our collections, research and public programs. In reaching out, the Museum must build on its long-standing tradition of "outreach" which takes its resources and programs to schools, parks, and communities.

Linkages: Working With Others

The Field Museum is a unique educational institution in a network of nearby and international educational institutions. We must work closely with neighboring schools, colleges, universities and research institutions to strengthen the quality and effectiveness of our collection-based research and public learning. We need to collaborate with other museums, environmental, cultural and recreational groups and organizations to fulfill our educational mission. The Museum has an obligation to seek out and collaborate with researchers and teachers who reside in the areas from which our collections come.

Center Of Understanding And Mutual Respect: Listening To Each Other

The Museum subject matter directly relates to the great issues of the present and future: environmental and cultural diversity and their interrelationships. There are differing scholarly and public viewpoints on these concerns. While the Museum does not take institutional positions on these issues, it must serve as a center of free inquiry, a marketplace for multiple points of view on these matters. In doing so it serves as a forum where relevant controversy can be aired. In this way the Museum can be a "door in the wall" of our differences and inspire greater knowledge, understanding and respect for our varied natural environments and cultural heritages.

Public Service: Our Commitment

We — the trustees, staff and volunteers of the Field Museum — are dedicated to public service. Together and individually we share a commitment to provide services and opportunities to our many publics. As an institution devoted to the study of diversity and relationships, we will practice diversity in our public contacts and staffing. We will nurture an environment of mutual respect which will extend to the public we serve. We will act ethically in our relations with the public and with each other. Collectively and individually we are committed to the mission of the Museum and our public service responsibilities.

Center for Evolutionary and Environmental Biology





SYSTEMATICS - THE SCIENCE OF PAST AND PRESENT BIOLOGICAL DIVERSITY

"You ask what is the use of classification, arrangement, systematization? I answer you: order and simplification are the first steps toward mastery of a subject—the actual enemy is the unknown."

Thomas Mann, "The Magic Mountain" (1924)

What is Systematics?—Systematics is both the oldest and the most general of all biological subdisciplines. It is fundamentally synthetic, integrating information from all other areas of biology to understand the relationships among living and fossil organisms. In return it provides a comparative framework for biological research — a map of past and present biodiversity — and a standardized reference system of names that is essential for communication throughout biology. Without systematics all comparative biological or biomedical studies would be scientifically suspect, and communication in biology (and its attendant applied disciplines of agriculture, horticulture and medicine) would be in chaos.

Current Status of Systematics—Systematics is a dynamic science dedicated to exploring the patterns and processes underlying similarities and differences among organisms. Because scientists must always accurately specify the identity of their study organism, systematics has always been one of the most pervasive of all branches of biology, but in the last decade, the discipline has undergone a striking renaissance initiated by a theoretical and methodological revolution. This revolution has substantially improved its rigor, and that has dealt with several significant philosophical issues that had formerly blocked progress. In parallel with these advances, there has been the development of increasingly sophisticated computer software for rapid numerical analyses of large or complex data sets, and developments in molecular biology that allow amplification and sequencing of RNA and DNA across a variety of organisms. Taken together, these advances have improved the integration of systematics with modern evolutionary biology and ecology, have attracted a new generation of scholars into the field, and have reoriented the perception of systematics within biology as a whole. Modern systematists view the world's biotic diversity as a single genealogy by which all species, living and extinct, are interconnected. It is the job of the systematist to reconstruct that pattern of relationship—the phylogeny—and this knowledge provides the foundation upon which much of biology is built. The demand for systematic expertise is now greater than at any time in the last 50 years. Not only are systematists in the front-line of crucial environmental concerns, but the schism between molecular and organismal biology is closing rapidly as scientists from both areas come together to more completely explore the basis of biological diversity.

Systematic Research at The Field Museum—Throughout Field Museum's history, the scientific staff has been actively engaged in systematic research and the institution has maintained the collections which make such work possible, both nationally and internationally. The Field Museum is recognized internationally as a leader in the theory of systematic biology, and has world-class systematic biologists working on amphibians, birds, bryozoans, cryptogams, fishes, flowering plants, fungi, insects, mammals, marine snails, mites, octopods, and reptiles. The organisms studied by these researchers span the globe geographically and the last billion years temporally. Research efforts in systematics are supported by Field Museum's extensive collections, library, scanning electron microscope facility, computing center, biochemistry laboratories, histology laboratory, functional morphology laboratory, paleomagnetism laboratory, and tissue culture laboratory. The needs of students at all levels are served through active training programs with area universities and schools. Research in systematics is basic to the work of almost all curatorial faculty, as well as the numerous interdisciplinary programs in which they are engaged.

The Field Museum, Chicago
Center for Evolutionary and Environmental Biology

INTERDISCIPLINARY PROGRAMS

CONSERVATION BIOLOGY

Unquestionably, one of the greatest environmental issues of the 20th Century concerns the rapid disappearance of species worldwide. Current rates of species extinction rival those of the most catastrophic episodes in Earth's four billion-year history. Species loss is particularly great in tropical regions and while tropical moist forests cover scarcely six percent of the world's land surface, they support about half of all plant and animal species. Many species remain undiscovered and undescribed, and we are ignorant of both their roles in natural communities and their potential uses (e.g., crops or pharmaceutical products). Fewer than 1500 scientists worldwide are trained and equipped to inventory tropical diversity. Currently, less than one percent of the world's fauna and flora is under scientific study.

For nearly a century, Field Museum's departments of Botany and Zoology have inventoried and described global tropical diversity. Encyclopedic collections, extensive libraries, a renowned community of scholars, and strong university ties have allowed the museum to assume a leading role in biodiversity issues. Traditionally, staff activities led to enormous collections and monographic treatises, such as the continuing series Flora of Costa Rica and Flora of Peru or the landmark volumes Living New World Monkeys (Platyrrhini), The Frogs of Sabah and the Flora of Guatemala. Increasingly, however, the activities of curators and other staff focus even more directly on conservation of biological diversity.

The impact of Field Museum programs on conservation biology is immediate and extensive. Field Museum botanical and zoological collections document historical range changes and population trends; the collections are also used to locate future parks and reserves. Museum curators, often in multidisciplinary collaboration, frequently produce the first inventory of species inhabiting tropical parks and are uniquely qualified to formulate species and habitat management recommendations. Museum scientists are also reshaping the conceptual framework of conservation biology, by broadening the scope of a discipline rooted in the temperate zone with hard-won data from tropical ecosystems. Ongoing research at Field Museum is extending the theoretical foundations of conservation biology, from a classical focus on how many species are present to include both species composition (which species are present) and evolutionary distinctiveness (how distinctive are species from forms found elsewhere). These studies help to predict how communities of organisms will change under different environmental pressures. At present, the National Science Foundation, National Geographic Society, Conservation International, Agency for International Development, and the MacArthur Foundation are all partners in this work.

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The Field Museum, Chicago
Center for Evolutionary and Environmental Biology

INTERDISCIPLINARY PROGRAMS

TRAINING IN SYSTEMATICS AND BIODIVERSITY STUDIES

The crisis of biodiversity loss presents an especially serious challenge because it comes on the heels of several decades in which universities emphasized molecular and cellular biology at the expense of organismal biology. Just when the need is highest for trained field biologists to discover, document, and interpret biological diversity there is a severe shortage of adequately trained professionals. Museums are some of the few institutions that have maintained, nurtured and developed expertise in systematic biology, and universities and governments are now turning to these institutions for help.

The Field Museum has embraced this important educational role with enthusiasm. Almost all Field Museum scientists hold joint appointments at degree granting institutions. Staff teach more than a dozen undergraduate courses and graduate courses annually. At present about 50 graduate students have Field Museum staff as members of their graduate advisory committees. Each year two to five postdoctoral fellows are in residence broadening the training they received as graduate students. More than 30 undergraduate and high-school interns participate in the programs of the the Center for Evolutionary and Environmental Biology annually. Through these and other programs Museum scientists can help to produce the well-trained college graduates required to deal with many of the biological problems that face society today.

Current educational programs in the Center for Evolutionary and Environmental Biology are also increasing efforts to train scientists from tropical countries, so as to reduce reliance on outsiders in assessing and managing their biodiversity resources. A training program for Philippine scientists is already in existence, and funding has been received to establish a more ambitious training program, in conjunction with the University of Illinois at Chicago and Brookfield Zoo, which will involve professionals and students from tropical countries all around the world. Field Museum supplements its efforts in this area through scholarship funds that are used primarily to encourage students and foreign scientists to visit Field Museum, use our collections and collaborate with staff.

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The Field Museum, Chicago
Center for Evolutionary and Environmental Biology

INTERDISCIPLINARY PROGRAMS

BIODIVERSITY INFORMATION RESOURCES

Computerization now pervades all aspects of modern science, and has had a revolutionary impact in the area of environmental and evolutionary biology. The development of high capacity, inexpensive computers and more sophisticated software has allowed for unprecedented electronic data capture, storage, analysis, and retrieval. Systematists have traditionally collected, analyzed, summarized, and communicated information using specimens as single-item samples of biodiversity. However, large collections themselves are also of great value to both scientists and society. In particular, as collection information is computerized, broader questions can be addressed, historical trends can be evaluated, and data can be shared between institutions.

Many of the Field Museum's 20 million specimens are already catalogued in computerized form. Our botanical, geological, and zoological databases include such data as hierarchical classification, geographic location, ecology, chemical composition and geologic age. Computer networking is rapidly expanding the availability of these information resources, which are becoming available to scientists from thousands of computers world-wide. Information from only one institution is typically inadequate to answer complex questions concerning global distribution patterns or changing species frequencies, thereby making retrieval of ever-growing electronic data from other institutions a necessity. Networking systems that allow access to museum collections and biological libraries throughout the world are now crucial to research and policy decisions in environmental biology. Researchers with network-connected computers routinely communicate through electronic mail and send data around the globe in minutes. Digitized color images of plants, animals, fossils, maps, and illustrations residing in remote sites will soon be available over networks and easily coupled with more traditional computer information. The development of geographical information systems will continue to integrate data from many disciplines into dynamic maps necessary to address research priorities such as the biodiversity crisis and global climate change. Over the last two decades, the Field Museum has set the pace in collections computerization and continues to take the lead in more sophisticated computer applications to biological resource issues.

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INTERDISCIPLINARY PROGRAMS

GEOCHRONOLOGY RESEARCH

The accurate subdivision and calibration of geologic time (geochronology) is crucially important in geological exploration, and central to many areas of pure and applied research in modern geology and environmental biology. Traditionally, changes in the composition of fossil assemblages through time have been used to develop a relative chronology of the stratigraphic record (biostratigraphy). The rates of decay of radioactive isotopes in other rocks have then been used to provide a numerical calibration of "absolute" time (radiometric dating). However, the full potential of these techniques has been difficult to realize because the best biostratigraphic time scales have been developed in ancient ocean basins while the best radiometric dates come from rocks deposited on ancient land surfaces. In the last twenty years the development of magnetostratigraphy, using the history of reversals in the Earth's magnetic field to "tell time," has provided a means of fully integrating biostratigraphic, radiometric and other stratigraphic techniques, leading to major advances in establishing increasingly accurate and globally applicable geologic time scales.

For almost a century the world-class fossil collections at the Field Museum have been used extensively in defining and refining biostratigraphic standards. Current programs extend these historic strengths to integrate biostratigraphy, magnetostratigraphy, and radioisotopic dating. The recent construction of a new magnetically-shielded laboratory for studies in paleomagnetism has made the Field Museum an internationally recognized center for geochronology. Research currently under way using the paleomagnetism facilities is: i) providing more secure and accurate age assignments for fossil-bearing strata, ii) developing a refined globally applicable standard geologic time scale, iii) using geochronologic information to understand plate tectonics and the rate and timing of mountain building and basin formation (Rocky Mountain basins; Magdalena Basin, Colombia; Chilean Andes), and iv) reconstructing paleoenvironments in hydrocarbon-bearing sedimentary basins (western North America, Chile, Colombia). At present, the National Science Foundation, National Geographic Society and NASA are all partners in this work. In 1985 a Field Museum geologist and two co-workers developed a standard geologic time scale for the past 66 million years, which is being used by the Geological Society of America as the time scale for its Decade of North American Geology Project. Recent users of the Field Museum paleomagnetism facilities include students and faculty from the University of Chicago, Northwestern University, Rutgers University, University of North Carolina-Charlotte, Universidad Autonoma of Mexico City, Duke University, and the State University of New York at Stony Brook.

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INTERDISCIPLINARY PROGRAMS

GLOBAL CHANGE RESEARCH

The diverse issues encompassed by the term "global change" (e.g., "greenhouse effect," ozone depletion, deforestation, declining freshwater resources) are among the most pressing societal concerns at the close of the 20th Century. Scientific investigation of these problems requires implementation of large-scale, interdisciplinary research designed with the realization that hydrologic, sedimentological, climatic, and geochemical systems are all affected profoundly by spatial and temporal changes in the Earth's biota. A central element of this new holistic research agenda is to look to the geological record as the key to understanding the complex biotic and environmental interactions that drive global change. Thus, for the relatively recent past, examination of polar ice cores provides essential data on changing concentration of atmospheric carbon dioxide associated with advancing and retreating ice sheets, while knowledge of the more distant past provides insight into the interactions between the Earth's surface and climate systems, the nature of the biosphere during former "greenhouse" intervals. These historical data also provide an opportunity to test the predictive power of the numerical climate models that are being developed based only on present-day information.

Paleontological collections at the Field Museum are a major international resource for elucidating the history of plant and animal life, providing baseline data from which the Earth's environmental history may be interpreted and hypotheses of future global change may be tested. For example, research under way at the Field Museum is using the paleobotanical record to decipher vegetational and climatic changes through a critical phase of Earth history between approximately 140—65 myr B.P. (the Cretaceous Period). This interval witnessed a major modernization of terrestrial ecosystems and was also characterized by rapid rates of sea floor spreading, high levels of atmospheric carbon dioxide, massive emplacement of flood basalts, and the evolutionary diversification of several modern groups of plants and animals. Mid-Cretaceous marine rocks are also estimated to be the source of approximately 70% of the world's oil reserves. Field Museum curators are using the extensive published record of pollen grains and spores to reconstruct the marked vegetational changes that occurred through this interval, including the origin and diversification of flowering plants, the rise of modern groups of ferns and conifers, and the extinction of ancient plant groups. With these patterns established, possible causal links to changes in Cretaceous global environments are now beginning to be addressed. In compiling these data Field Museum researchers are collaborating with colleagues from the University of Chicago and University of Queensland Australia, and have received support for pilot projects from the Petroleum Research Fund of the American Chemical Society.

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INTERDISCIPLINARY PROGRAMS

DEVELOPMENTAL BIOLOGY AND BIOTECHNOLOGY RESEARCH

Comparative studies of plant and animal development have moved to center stage of modern biology, and are fast becoming one of the most active fields of research on the evolution of biological diversity. Classical approaches to evolutionary biology, such as population studies, concentrate on the variability of traits and their genetic background, yet fail to account for the fact that it is not traits nor characters that are inherited, but the potential for their development during the ontogeny of each organism. This means that every evolutionary change is reflected by a change in the sequence of developmental events, just as every change of developmental pathways causes an evolutionary change in the population of reproducing organisms. Therefore, the comparative study of developmental pathways, and the inquiry into their underlying causes, holds important keys not only to our understanding of how organisms develop but also to our understanding of the phylogenetic past.

In zoology, developmental studies at the Field Museum include studies of skeleton formation in reptiles, in particular on the sequence and patterns of bone formation. These investigations apply histological techniques of whole mount imaging to embryos of all major reptile groups (turtles, crocodiles and lizards) and provide important insights into "ontogenetic repatterning"—the development of new structural patterns as cartilage is replaced by bone. Understanding of "ontogenetic repatterning" is crucial for the reconstruction of evolutionary relationships, but also provides the basis for a more detailed investigation of patterns of skeletal reduction in fossil and living reptiles. Preliminary evidence suggests an influence of temperature and moisture during incubation on ossification processes as well as the importance of habitat factors.

In botany, there is now great interest in genetically engineering plants to improve their resistance to disease, increase their tolerance to drought, and to improve their commercial attributes (e.g., larger flower size in horticulture, improved yield in agriculture). In the past, systematists have contributed to achieving these kinds of improvements through their role in plant breeding programs. This will continue but recent developments in biotechnology offer even greater possibilities for genetic engineering and these too require the input of systematic expertise. One recent project with an international biotechnology research group examines the evolution of specific chemicals (osmoprotectants) that impart increased resistance to arid or saline conditions. The ultimate objective is to identify the genes controlling the synthesis of these compounds with a view to their transfer to appropriate agriculturally significant species.

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PROGRAMS IN NORTH AMERICA, THE ATLANTIC AND EUROPE

NEVADA—Marine Reptiles from Northwestern Nevada—Olivier C. Rieppel, Geology—Marine fossil reptiles such as ichthyosaurs have long been known to occur in the Fossil Hill Member (of Anisian, Triassic age, 240 million years ago) in the Prida and Favret Formations of the Star Peak Group, northwestern Nevada. The Fossil Hill Member is particularly well-exposed in Favret Canyon and smaller canyons further south in the Augusta Mountains. Invertebrate (ammonite) and microvertebrate faunas served as a guide to locate the fossiliferous deposits. In 1993 the search for articulated marine reptile skeletons was rewarded by the discovery and excavation of a relatively large partial skeleton of a sauropterygian with a character combination that promises to profoundly change our current understanding of sauropterygian interrelationships. This fossil is the only sauropterygian known from the New World other than the enigmatic genus *Corosaurus* from the Middle Triassic of Wyoming.

WYOMING—Eocene Faunas of Southwest Wyoming—John J. Flynn, Lance Grande, Steven McCarroll and William D. Turnbull, Geology—Field Museum has more than a 40-year history of collection and research on the fossil vertebrate faunas of southwest Wyoming. The terrestrial rocks of the Washakie Basin and the lacustrine deposits of the Green River Formation preserve the most complete early to middle Eocene (56-44 million years) sequence of vertebrate evolution in the world. Included in the Washakie Basin sequence are several important transitions between North American Land Mammal Ages. In addition, radioisotopic dating and magnetic polarity stratigraphy analysis are possible, giving independent tests of the timing and correlations of vertebrate evolution in North America. Recent research has focused on the enigmatic rodent genus *Protoptychus*; a revision of the uinatheres, marsupials, and perissodactyls; and a revision of the age of the Washakie Formation. The Green River Formation contains the largest known sequence of ancient lake deposits, and the most detailed look at the emergence of the modern North American fish fauna over the last 50 million years.

IOWA—Mississippian Fossil Tetrapods and Early-Tetrapod Phylogeny—John R. Bolt, Geology, and R. Eric Lombard, (Research Associate, Geology and Zoology) and University of Chicago—The earliest tetrapods (land vertebrates) are from the Upper Devonian, about 370 million years before present (B.P.) and from this point to the end of the Carboniferous (c. 290 million years B.P.), tetrapod fossil remains are rare and often poorly preserved. Recent collecting in the Mississippian of Iowa has yielded a major collection of fossil tetrapods from a very poorly represented time period (c. 340 million years B.P.) that includes several groups of early and very primitive land vertebrates. Once fully removed from the rock and studied, the Iowa specimens will make a very important contribution to understanding the early evolution of tetrapods. This project is occurring at an opportune time because a remarkable number of new localities for Devonian and Mississippian tetrapods have recently been discovered. The diversity and quality of early tetrapod fossils is now adequate to give a much better picture of the earliest stages of vertebrate life on land.

NORTH AMERICA—Systematics and Ecology of Deep-Soil Mites—John Kethley, Zoology—The biodiversity of deep-soil arthropods is virtually unstudied despite their potentially great significance for understanding nutrient cycling, community structure and as indicators of pollution. Research has involved the development of methodologies to properly document this fauna. Field work has emphasized soils of coastal, alluvial, fluvial and glacial out-wash origins. Recently collected specimens have proven to be new to science and are being described to develop a comparative data base for subsequent ecological, phylogenetic and zoogeographic studies.

NORTH AMERICA (AND WORLD-WIDE)—Systematics of the Moss Family Polytrichaceae—Gary Merrill, Botany—Research over the past 25 years has been focussed on the Polytrichaceae, or “Hair-cap Mosses”, a family of world-wide distribution, comprising 22 genera and c. 300 species. The family is an isolated and phylogenetically primitive group, with no extant (or known fossil) relatives, and is notable for the structural complexity of both gametophyte and sporophyte generations. They are the only known gametophytes with specialized internal conducting tissues, comparable to those of simple vascular plant sporophytes. Current projects include treatments of Polytrichaceae for the Moss Flora of Mexico (7 genera, 21 spp; published Jan 1994), and for Volume 13 of Flora of North America (10 genera, 48 spp; scheduled for completion in 1995), and an outline of a revised and updated classification of the family.

NORTH AMERICA—Studies of the Bryoflora of the Great Plains Region—Gary Merrill, Botany— The Great Plains region is bryologically the poorest known part of the North American continent. Distribution patterns of bryophytes in the region appear to reflect the same complex vegetational history inferred from the distributions of phanerogams. Research has been directed toward an inventory of the bryophytes of the Great Plains, which is basic to an understanding their role in past and present-day grassland communities. A small group of species appear to be true prairie mosses, flourishing in “healthy” tallgrass prairies which are both grazed and burned. An important recent discovery, the new genus and species *Ozobryum ogalalense* Merrill, is restricted to NW Kansas and adjacent Nebraska. Since bryophytes are capable of persisting as distributional relicts which reflect past climatic conditions and floras, endemics such as *Ozobryum* may be clues to earlier regional floras of which they are the sole survivors.

ATLANTIC OCEAN—Biodiversity and Phylogenetic Systematics of “Worm-snails”—Rüdiger Bieler, Zoology—Worm-snails have enigmatic relationships within the gastropods and despite their major importance in the study of snail evolution are virtually unstudied. They are also of great importance as natural reef builders in the world’s oceans. The animals cement their tube-shaped shells to hard surfaces and do not move during their adult lives. Because of their unusual biology, worm-snails could play a role in coastal protection schemes and as indicators for water pollution, but the absence of basic taxonomic information precludes such applications. Most of the recently collected specimens have proved to be previously undescribed species, which are now being monographed to form a basis for future zoogeographic and phylogenetic studies. Extensive field work in the Bahamas, Belize, Bermuda, Florida, Panama and Venezuela has been aided by the Bermuda Biological Station, the Smithsonian Marine Station and the Smithsonian Tropical Research Institution. Comparative data are also being collected in Portugal and the mid-Atlantic Azores.

UNITED KINGDOM—Character Database for Paleozoic Tetrapods—John R. Bolt, Geology, and R. Eric Lombard, (Research Associate, Geology and Zoology) and University of Chicago—Paleozoic tetrapods are known from the Upper Devonian about 370 million years before present (B.P.) through the end of the Permian (about 260 million years B.P.). The tetrapod fossil record gradually improves over this time span, and there are many more species from the Permian than from earlier Periods. New specimens, especially from the earliest phases of tetrapod evolution, are becoming available, and computer-assisted techniques for studying evolutionary relationships are now in widespread use. In order to make the best use of new research tools and recently-acquired specimens, we need to assemble larger and more sophisticated databases than are now available, and this should be done on a worldwide basis. We are collaborating in this project with Dr. Jennifer Clack of the University of Cambridge, who is an active researcher on early tetrapods and will contribute her expertise on the European material.

UNITED KINGDOM—Large-Scale Evolutionary Trends in Bryozoans—Scott Lidgard, Geology—In collaboration with Paul Taylor of The Natural History Museum, London, the project is designed to quantify the global marine evolutionary radiations and extinctions of major groups of bryozoans through geologic time, as a model for understanding the evolutionary histories of other major animal phyla. The research relies heavily on classic museum, as well as new field, collections from North America and Europe. Work to date has shown the supposed competitive replacement of cyclostome bryozoans by cheilostome bryozoans to be far more complex than had been assumed previously. Cheilostome species do indeed increase in number but there is little significant change in the number of cyclostome species.

EUROPE—Reptiles from the German Triassic—Olivier C. Rieppel, Geology—A relative sea level rise during the Middle Triassic (early Anisian, about 240 million years before present) resulted in a marine transgression covering large parts of what today constitutes central and northeastern Europe. During this interval a diverse fauna of marine reptiles immigrated through the East Carpathian Gate which established itself in this tropical and partly shallow "Muschelkalk sea," (a northern epicontinental extension of the Tethys—the ancient "Mediterranean" sea). Fossil reptiles from the Muschelkalk provide a unique opportunity to study the evolution of secondarily marine reptiles in relation to their biotic and abiotic environment. Rieppel is pursuing a comprehensive study of Muschelkalk reptiles in the natural history museums of Germany, Austria and Poland in an effort to reconstruct their evolutionary interrelationships. This work will serve as a basis for inferring their adaptational strategies and understanding patterns of skeletal ossification in modern reptiles.

NORTH AMERICA and EURASIA—Systematic Comparisons of Fossil and Living Amiid Fishes—Lance Grande, Geology—This is a large-scale systematic project on the comparative anatomy and evolutionary history of fossil and living amiid fishes. Amiid fishes are widely acknowledged as a key group for developing a better understanding of the evolution of ray-finned fish—the most diverse group of vertebrates. Research involves detailed study of early embryology in modern *Amia* as well as fossil bowfin material from numerous localities around the world. Localities of special interest included the Eocene deposits of Messel and Geiseltal, Germany; the Jurassic deposits of Solenhofen, Germany, and Cretaceous localities in England. This project involves visiting museums and localities in England, Germany, Israel, Russia and Spain.

NORWAY—Ordovician Algal Floras from Norway—Matthew H. Nitecki, Geology—About 500 million years ago Europe was the bottom of an equatorial sea covered with abundant, luxuriant life. The extensive mountain-building processes that followed transformed the warm-water sediments into metamorphic rocks and almost entirely obliterated the fossil record. A small portion of the marine basin was preserved in the Oslo region, providing an unusual window to early marine life, and particularly the extinct cyclocrinitid algae. This project was initiated in Norway with Norwegian colleagues during tenure as a Fulbright-Hays Research Scholar and Visiting Professor at the University of Oslo.

SWEDEN and THE BALTIC SHORE—Analysis of Receptaculitid Problematic Fossils—Matthew H. Nitecki, Geology—During the last glaciation in northern Europe, extensive ice sheets excavated deeply buried rocks, with their enclosed fossils, and transported them along the shores of the Baltic. These fossils can now be collected from the glacial boulders which contain an unusual assortment of fossils. Among these are the 300-million-year-old problematic organisms, the receptaculitids. These fossil assemblages, and particularly the receptaculitids, are being studied both in the field and from specimens in the Swedish Natural History Museum.

EASTERN NORTH AMERICA and PORTUGAL—Fossil Flowers and Angiosperm Evolution—Peter R. Crane and Patrick Herendeen, Geology—With more than a quarter of a million species, flowering plants (angiosperms) are the most diverse group of plants on the planet. Their relatively sudden appearance in the fossil record about 120 million years before present, and their rapid expansion to dominate terrestrial vegetation, has long been one of the central enigmas of plant science. Current research at Field Museum, in collaboration with scientists from the Swedish Natural History Museum and the University of Aarhus, Denmark, is using very early fossil flowers from Europe and North America to clarify the pattern of early angiosperm evolution. These studies are being integrated with data from fossil pollen to understand how this evolutionary pattern relates to major events of global environmental change that occurred at approximately the same time c. 100 million years ago.

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PROGRAMS IN CENTRAL AND SOUTH AMERICA

BRAZIL—Distribution and Affinities of Atlantic Forest Mammals—Bruce D. Patterson, Zoology—The Atlantic Forests of southeastern Brazil harbor unique and diverse faunas and floras. High rates of human settlement and habitat conversion have made these forests one of the world's most pressing conservation priorities. To date, however, we have little information on the mammal species that occur there, their distribution and abundance, and their affinities to moist-forest faunas elsewhere in the New World tropics. Some of the most extraordinary members of this fauna are known only by a handful of specimens or incomplete habitat notes from a few localities. On-going field studies seek to create a more complete, comprehensive database for these species by compiling a complete inventory of those occurring at Boracéia, a reserve managed by the Universidade de São Paulo. Phylogenetic studies are being undertaken to illuminate the evolutionary histories of endemic taxa. Analyses of mitochondrial DNA of fig-eating bats (*Artibeus*) suggest that the Atlantic Forest fauna may be among the most ancient in South America, and perhaps "ancestral" to the diverse communities found in the Amazon Basin. Similar phylogenetic studies of non-flying mammals are underway to establish the generality of these results.

CHILE—Fossil Mammal Faunas and Geology of the Andean Main Range—John J. Flynn, Geology—During most of the last 80 million years South America drifted as an island continent. The highly peculiar land mammals which arose in response to this isolation have captured the interest of biologists and paleontologists for more than two centuries. Research has yielded two new and highly unexpected fossil mammal assemblages in volcanic sediments of the Andes mountain chain in central Chile. These assemblages help to fill in what was previously a lengthy gap in the South American fossil record between approximately 30 and 50 million years before present. This gap coincides with an interval of fundamental faunal and climatic changes in South America, as well as with the first arrival on the continent of two exotic lineages — primates and rodents. In addition to several other important first and last occurrences, this assemblage is notable in containing the earliest known rodents from South America, is a good prospect for yielding early primates in the future, and serves to "bridge" a critical time interval between faunas dominated by archaic forms and those of more "modern" aspect. Occurrence of these fossils in volcanic-derived rocks also permits application of various "absolute" geologic dating techniques to provide precise age calibration for the assemblages. The University of Chile, University of California, Santa Barbara, American Museum of Natural History, Institute of Human Origins and the National Museum of Chile are all partners in this work. This on-going collaborative project will help clarify biotic, environmental, and geologic events during crucial intervals of South American land mammal history.

CHILE—Systematics and Evolution of the Chilean Campanulaceae—Thomas G. Lammers, Botany—Lammers is contributing the taxonomic treatment of Campanulaceae to the new Flora de Chile, being prepared at the Universidad de Concepción, and has made extensive collecting trips throughout the country. Of particular interest is the evolution of two clades endemic to Chile. The first of these, the *Lobelia tupa* complex, represent the only known hexaploids among the woody members of the family. The other, the *Wahlenbergia fernandeziana* complex, is restricted to the Archipiélago de Juan Fernández and possesses a unique basic chromosome number ($x=11$ in a genus that otherwise has $x=9$). This research will shed light on the relationship between changes in chromosome number and the acquisition of the woody habit by otherwise herbaceous groups of plants.

CHILE and ARGENTINA—Ecology and Evolution of Mammals in South Temperate Rainforests—Bruce D. Patterson, Zoology—Like the spruce and redwood forests of our Pacific Northwest, the giant southern beech (*Nothofagus*) forests of Chile and adjacent Argentina constitute true temperate rainforests. Also like our own rainforests, Chile's support a rich endemic fauna that is threatened by economic development and logging. Over the last decade, the unique mammal faunas of these forests have been examined, including their genetics, ecology, evolution, and relationships to faunas elsewhere. Studies of community change along an elevational transect illuminate habitat and food-use of species. Reliance of both plants and animals on underground fungi—mammals for food and trees for water and nutrients—bind all of these groups into highly integrated and coevolved communities. The 1992 discovery of a new genus and species of long-clawed mouse emphasizes that much remains to be learned about this biota, which is highly differentiated from others in South America. In fact, the endemism of rodents and marsupials in *Nothofagus* forests exceeds that for the same groups in ancient, isolated New Guinea. Moreover, studies of endemic marsupials there—both the shrew opossum and monito del monte—tell us about the dawn of the Age of Mammals in South America, including the ancestry of Australia's marsupials.

COSTA RICA—Flora Costaricensis—William Burger, Botany—For the past 25 years, this project has focused on collecting and studying Costa Rican flowering plants. This work, together with the contributions of colleagues, has provided treatments for the encyclopedia-like Flora Costaricensis series. This flora provides basic taxonomic nomenclature, detailed morphological descriptions, and ecological information available through the use of keys and illustrations and is a basic resource for all those working with the vegetation and ecology of Costa Rica and adjacent areas. Close collaboration between the Field Museum and the Museo Nacional de Costa Rica, first initiated in the mid-1930s, is the basis for these ongoing programs.

GUATEMALA—Plant Collecting Program—Djaya Doel Soejarto, (Research Associate, Botany) and University of Illinois at Chicago—A plant collecting program is being undertaken in Guatemala with the cooperation of the Herbarium of the Faculty of Agronomy, University of San Carlos, Guatemala. Although the primary goal of the project is the collection of plant samples for evaluation for their biological activity and potential pharmacological utility, all samples are fully documented by voucher herbarium specimens. General collecting throughout Guatemala is also being undertaken as part of this fieldwork operations. A set of duplicates of all collections is deposited at the John G. Searle Herbarium, Field Museum, as well as in the host herbarium institution. From the botanical point of view, the importance of the project is to contribute new data and to enrich the database of herbarium collections of the flora of Guatemala, and will be useful in further increasing our knowledge of its flora and vegetation.

MEXICO and CENTRAL AMERICA—Mushrooms and Other Fungi of Neotropical Oak Forests—Gregory M. Mueller, Botany—Mueller continues the work of the late Rolf Singer in studying the biodiversity, distribution patterns, and ecology of mushrooms and other fungi that occur in the oak forests of Honduras, Costa Rica and Colombia. Current work on this project is centered in Costa Rica. These fungi are vitally important for the health and survival of such forests. Determining which fungi are present, and understanding their ecological role, has important conservation and forest management implications. This project also involves helping develop research on fungi by local scientists and students. This has included training graduate students and finding the funds needed to upgrade facilities.

MEXICO and CENTRAL AMERICA—Boletes of Mexico and Central America—Greg Mueller, Botany—This project is based on current fieldwork as well as collaboration with the late Rolf Singer and Field Museum Research Associates, Jesús García (Ciudad Victoria, Mexico) and Luís D. Gómez (San Vito, Costa Rica). Research focuses on an important group of fungi known as boletes. There are over one hundred species of boletes occurring in the region from Mexico south to Costa Rica. Many are important edibles and most species form a mutually beneficial symbiotic relationship with oaks, pines, firs, etc. Neither the trees nor the fungi can survive without the other. Four volumes of an anticipated seven volume work are now published with the fifth volume near completion.

NEOTROPICS—The Origins of Avian Biodiversity: A Case Study—Scott M. Lanyon, Zoology—The New World Blackbirds (Icterinae) demonstrate perhaps the widest range of ecologies, morphologies, and behaviors found in a single subfamily of birds. The Icterinae contribute significantly to the extremely high bird species diversity in the New World Tropics. In collaboration with ornithologists in the neotropics, collecting trips have been organized throughout South America and additional trips are in preparation in Middle America and the Caribbean to obtain frozen tissue samples for biochemical (DNA sequencing) investigations of the history of this assemblage. By reconstructing the history of blackbirds the project hopes to identify the historical factors responsible for the extreme diversity of this group. This research program will enable predictions about the diversity in more distantly related birds as well as about some of the poorly studied species of blackbirds. Once the evolutionary history of this group is better known, the next phase will be to study the ecologies and life histories of the many fascinating but poorly-studied blackbird species.

NEOTROPICS—Systematics of Eriocaulaceae—Nancy Hensold, Botany—The Eriocaulaceae are a little known monocot family of about 1,200 species that is most diverse in the "campos rupestres" of Central Brazil. These unique habitats, characterized by thin, extremely nutrient poor soils, support paradoxically high levels of diversity and endemism of flowering plant species, of which the Eriocaulaceae represent an extreme example. For example, *Paepalanthus* subg. *Xeractis*, recently monographed, comprises 27 species endemic to a small mountain range only 370 km long and 10-40 km wide. Approximately 250 additional species of the same genus are thought to occur in the same area, most of them endemic. It is hoped that by studying the taxonomy and diversification patterns in this genus, much can be learned about the reasons for high species diversity in the "campos rupestres." In addition, a family treatment has been provided for the Flora Venezuelan Guayana (in press), and a partial revision of South American *Syngonanthus* is in preparation.

PERU—Systematics of Peruvian Asteraceae—Michael O. Dillon, Botany—This project has been based on an extensive program of fieldwork in Peru since 1978, when a floristic treatment of the Asteraceae for the Flora of Peru was initiated. The Asteraceae is the second largest family of plants in Peru, with over 1,400 species, and is found in all habitat types. It was one of the few families left untreated by J. Francis Macbride in his Flora of Peru. Three tribal treatments have now been completed, an additional three have been edited, and work on other tribes is in progress. In collaboration with Nancy Hensold, the Asteraceae treatment for the Catalogue of the Flowering Plants and Gymnosperms of Peru (an updated species checklist) has been completed. This preliminary work suggests that the Asteraceae has the highest percent species endemism of any of the larger families in the country. More than half of these species of Asteraceae occur only in Peru.

PERU—Inventory of Montane Forests of Northern Peru—Michael O. Dillon and Nancy Hensold, Botany and Abundio Sagástegui Alva (Research Associate, Botany) and Isidoro Sanchez Vega (Research Associate, Botany)—The montane forests of northern Peru represent the southernmost extension of a once-continuous humid forest formation extending to Colombia, and later fragmented into isolated "pockets" by climate change, uplift, and more recently, deforestation by humans. The remaining fragments are small and highly threatened refuges containing many taxa which are endemic, or find their southern limit in Peru. Since 1985 this project has collaborated closely with Peruvian scientists from three area universities to collect and inventory these areas. These efforts have included frequent fieldwork, obtaining funds for badly needed computers and collecting equipment for local herbaria, teaching mini-courses to Peruvian students, and facilitating travel by collaborators to the Field Museum. A preliminary inventory of one forest area, Bosque Monteseco, was published in 1991. Four additional threatened forest fragments are being inventoried now, to construct a detailed picture of biogeographic relationships of these areas, and to suggest conservation priorities.

PERU—Distribution and Abundance of Mammals in Andean Peru—Bruce D. Patterson, Zoology—No terrestrial environment in the world harbors more species than the western Amazon Basin where it meets the foothills of the Andes Mountains. Peru's Manu Biosphere Reserve, which includes South America's largest national park, has been the site of mammal surveys undertaken by Field Museum in collaboration with researchers from Universidad de San Marcos (Lima), the University of California (Berkeley), and the National Museum (Washington). From top to bottom, one valley in this reserve (the Río Cosñipata) is known to harbor twice the number of mammal species found in the eastern third of North America. Field samples and studies of museum collections establish the elevational ranges of species in these communities, including the presence of several species new to science. Patterns in species replacement help to indicate the nature of individual adaptations and the long-term integrity of communities occurring at different elevational levels. On going studies at Field Museum now focus on bat communities that comprise a third of all mammals species in the reserve. The project has become a highly effective vehicle for training Peruvian biologists in the theory and practice of field sampling and museum-based studies of biodiversity.

PERU and CHILE—Flora of the Lomas Formations—Michael O. Dillon, Botany—Coastal Peru and Chile, between about 5° and 29°S, is home to a unique plant community termed the lomas formation. These scattered "green belts" are islands in hyper-arid desert, occurring only on fog-bathed slopes close to the seashore. Species endemism in the lomas exceeds 40 percent, and suggests a long period of evolutionary isolation. Between 1983 and 1989, in fertile years of El Niño phenomenon rainfall, extensive collections were made in these areas, and a preliminary species checklist and database of specimens from several herbaria was produced. In a collaborative project, the database is now being used to study floristic changes in the lomas over the last century, which may be linked to global warming. Work also proceeds to resolve basic taxonomic problems and publish a manual of lomas plants.

PERU and CHILE—Systematics of the Nolanaceae—Michael O. Dillon, Botany—In connection with studies on the flora of the lomas, a monographic study of the endemic lomas genus *Nolana* has been undertaken. Between 18 and 80 species of these succulent showy-flowered herbs are estimated to occur, depending on the specialist consulted. Morphological, chloroplast DNA, and seed propagation studies are being conducted with collaborators. Because of the extensive radiation of this genus within the lomas formations, it is proving especially informative as to the biogeography and history of these unique plant communities.

VENEZUELA—Systematics, Biogeography and Conservation of Fishes of the Orinoco Drainage—Barry Chernoff, Zoology and Antonio Machado-Allison (Research Associate, Zoology)—The Orinoco River is only second to the Amazon in terms of the diversity of fishes it supports. There are more than 1,000 named fish species living in the Orinoco of Venezuela. This project is a collaboration with the professors and students at the Institute of Tropical Zoology, Universidad Central de Venezuela in Caracas. Studies are designed to contribute to both science and conservation. We are interested in the gradients of fish diversity among the numerous habitats and physical environments; for example, from the Andes to Llanos to Amazonian flooded forests. In each region, we discover which fishes are present, and uncover many new species. Phylogenetic relationships are also studied and these are critical for our understanding the historical connections and geographic pathways that have influenced evolutionary diversification. For example, we have discovered many species from the Guyana Shield, whose closest relatives live in the Andes of Ecuador and Peru, and not in the Amazonian lowlands. We are especially interested in the fishes of fragile habitats, such as the spring-like morichals, with high degrees of endemism. These scientific studies are used along with fisheries information to help establish conservation guidelines and reserves in Venezuela. All of our information is computerized in both of our home institutions and made available internationally on computer networks via the NEODAT project on Biodiversity Gopher.

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PROGRAMS IN AFRICA

BURUNDI, ZAIRE and UGANDA—Small Mammals in the Mountains of the Albertine Rift—Julian C. Kerbis Peterhans (Research Associate, Zoology)—For the past few years, this project has coordinated small mammal surveys in the mountains adjacent to the Albertine Rift in Central Africa including Kibira National Park (Burundi), the Ituri Forest National Park (Zaire) and Rwenzori National Park (Uganda). Collaborators include l'Institut National pour l'Environnement et la Conservation de la Nature and the Peace Corps/USAID Biodiversity Project (Burundi), Institut Nacional pour la Conservacion de la Nature and New York Zoological Society (Zaire) and Makerere University and the Department of Forestry (Uganda). The goals of these surveys are to develop comprehensive surveys of small mammals from these isolated mountain tops, to assess the biogeographic history of the different mountain tops by comparing faunal communities within and among African montane zones, and to develop within-country programs, reference collections and expertise to continue surveying and monitoring small mammals. Preliminary results show that mountains of the Albertine Rift house: i) independent small mammal faunas but with numerous elements in common, ii) Africa's richest sorcid (shrew) community, with 7 genera and 17 species from Kibira alone, indicating that this area has been fundamental in the origin, diversification and maintenance of African shrews, iii) Africa's richest endemic small mammal community comprised of 39 species of rodents and shrews. These studies are especially timely for conservation management decisions as two of these areas (Ituri and Ruwenzori) have been established as National Parks in the past 12 months. Finally, results have further enabled us to establish the taxonomic status of other taxa not known from the Albertine Rift, such as *Nilopegamys*, the Ethiopian water mouse, which had been confused with a similar species from the Zaire basin for more than 30 years.

MADAGASCAR—Biodiversity Through Space and Time—Steven M. Goodman, Zoology—The fauna of Madagascar, the world's fourth largest island, is notable because of its extraordinarily high degree of endemism (most species found on Madagascar are found nowhere else in the world) and because of the very high percentage of this fauna that currently is threatened with extinction, primarily as a result of human-mediated habitat destruction and disturbance. Several research programs are underway to provide biological underpinnings to conservation efforts in Madagascar, with particular emphasis on birds and mammals. One aspect of this research is to carry out faunal surveys that document the current fauna at these sites. This information can then be used to manage refuges so as to maintain current levels of biodiversity, allow rankings of the relative importance of different reserves, and provide basic natural history information on threatened species. It is well-documented that a wave of extinction affecting large-bodied animals, including elephant birds, took place on Madagascar at about the time that humans colonized the island, but knowledge of the islands' fauna in the recent past is still incomplete. To assess the influence of human activity on the fauna in the recent past, another research program is an investigation of sub-fossil vertebrate deposits. A key component to all research on Madagascar involves training of Malagasy students.

MADAGASCAR—Late Cretaceous Mammals and Other Fossils from Madagascar—Gregory A. Buckley, Geology—The unique biota of Madagascar, off the east coast of Africa, is well known and of great zoological and conservation interest. Unfortunately, the origin and evolutionary history of the Malagasy fauna and is poorly known, due primarily to a scanty fossil record on the island. This project is part of a multi-institutional expedition to Madagascar in 1993 that collected an extremely diverse Late Cretaceous vertebrate fauna (including the first Late Cretaceous mammal ever to be found in Africa, several dinosaur species, the earliest known Madagascan frogs, and several varieties of fish, turtles, lizards, snakes and crocodiles), as well as a diverse Late Cretaceous and early Tertiary invertebrate fauna. Buckley is also conducting a paleomagnetic investigation of the area to more precisely determine the age of the fossils. Pending funding, expeditions will be conducted during the next three summers, with a portion of these collections to be housed at the Field Museum.

MADAGASCAR—Evolutionary History of the Avifauna of Madagascar—Thomas S. Schulenberg, Zoology and University of Chicago—Although Madagascar is separated from the African mainland by only a few hundred miles, the birdlife of Madagascar seems completely different. In part this is because some birds on Madagascar appear to represent extreme examples of adaptive radiation, a type of explosive evolution in which the descendant species of an original colonizing form have diversified widely. The best case of this on Madagascar is provided by the 14 species of vangas. The ancestor to this group was probably a generalized shrike, but current species of vanga exhibit more diversity in shape or behavior, as do such classic examples as the Darwin's finches of the Galapagos. The current study uses DNA sequencing, a molecular technique for phylogenetic reconstruction, to determine the pattern of evolution within vangas and their ancestors.

NIGERIA—Plant Collecting Program—Djaya Doel Soejarto, (Research Associate, Botany) and University of Illinois at Chicago—A plant collecting program is being undertaken in Nigeria with the cooperation of the Forest Research Institute of Nigeria. Although the primary goal of the project is the collection of plant samples for evaluation for their biological activity and potential pharmacological utility, all samples are fully documented by voucher herbarium specimens. General collecting throughout Nigeria is also being undertaken as part of this fieldwork operation. A set of duplicates of all collections is deposited at the John G. Searle Herbarium, Field Museum, as well as in the host herbarium institution. From the botanical point of view, the importance of the project is to contribute new data and to enrich the database of herbarium collections of the flora of Nigeria, and will be useful in increasing further our knowledge of its flora and vegetation.

TANZANIA—Forest Fragmentation and Conservation of Small Mammals in the Eastern Arc Mountains—Steven M. Goodman and William T. Stanley, Zoology—The Eastern Arc Mountains parallel the Indian Ocean coast in eastern Tanzania, and contain some of the most biologically diverse montane ecosystems in all of Africa. Recent field work and systematic studies indicate that a large number of forest endemic species of both plants and animals occur in these mountains but much of this forest has been destroyed, or is threatened by human encroachment. In conjunction with the University of Dar es Salaam, this project studies the small mammals (insectivores, bats, and rodents) of these mountains to determine their distribution and natural history and develop effective strategies to conserve their habitat. The project is also investigating the biogeographical relationships of various Eastern Arc Mountains to each other, as well as to other mountains in eastern Africa. Primary goals include working with Tanzanian biologists and local government officials in developing conservation strategies, and also to support the Department of Zoology Vertebrate Museum, University of Dar es Salaam, which plays an important role in housing important research material and the education of Tanzanian zoology students.

UGANDA—Birds of the Rwenzori Mountains—David E. Willard and Thomas P. Gnoske, Zoology—While the avifauna of the Rwenzori Mountains was fairly well-documented as long ago as the turn of the century, little information was gathered regarding ecology or elevational ranges. These mountains have also experienced dramatic changes in habitat over the last century. This study seeks to document the current birds of the Rwenzori Mountains, and to compare them to the now much better known faunas of other mountains on the west side of the Albertine Rift. An elevational transect in the Mubuku Valley at the southern edge of the range has been accomplished; a similar survey in the Semliki Valley at the north end of the range will complete the project.

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PROGRAMS IN ASIA, THE INDO-PACIFIC AND AUSTRALASIA

AUSTRALASIA—Morphological Species Concepts in Bryozoans: A Test Case in *Adeonellopsis*—Scott Lidgard, Geology—This project seeks to quantify how much variation exists in characters that are used to determine species in colonial bryozoans. Even within a colony, individual zooids may differ as much as those from colonies in geographically separate populations or even different species. Colonies of the genus *Adeonellopsis* from dozens of localities covering Australian and New Zealand were analyzed by video-digitizing techniques. This research has determined that an alarming number of cryptic species exist within currently accepted yet poorly defined species boundaries. If these results hold for other genera, the global diversity of bryozoans (currently estimated to be about the same as mammals) may be underestimated by a factor of two, three, or more.

AUSTRALASIA—Systematic Studies in Lepidoziaceae (Hepaticae)—John J. Engel, Botany—The south temperate areas of the globe are notable for the large concentration of relatively ancient representatives of numerous families and genera of Hepaticae. Many, if not all of the major suborders appear to have their most primitive extant members in Australia, New Zealand, and southern South America. Previous field seasons have resulted in the accumulation of a major research collection of New Zealand and Tasmanian hepatics, which is currently being studied. Monographs of selected genera are being prepared as part of the Hepatic Flora of New Zealand program, in collaboration with Dr. Rudolf Schuster. Volume 1 of the manual of New Zealand Hepaticae is scheduled for completion in 1994, and work is proceeding on monographs of two large Australasian genera, *Telaranea* and *Lepidozia*, in collaboration with Field Museum Research Associate Gary Merrill.

AUSTRALIA—Pliocene and Pleistocene Faunas of Australia—William D. Turnbull, Geology—As a part of an ongoing study of the Australian fauna over the past 40 years, this project has collected and reported extensively on Pliocene and Pleistocene fossil mammals of that continent. The most recent work concerns the small faunule from Smeaton, Victoria and focuses on interpreting the nature of the deposition of the entombing sediments. The area has several volcanoes which have lava flows that seem to block the local drainage pattern, contributing to deposition of the sediments. In collaboration with Eric Wilkensen of the Victorian Mines Department, research is attempting to learn more of the history of these deposits, which are known to preserve three or four superposed fossiliferous beds.

AUSTRALIA—Staphyliniform Beetles of Australia—Alfred F. Newton and Margaret K. Thayer, Zoology—This poorly known group of beetles includes about 2,000 named species in Australia, but at least three times this many species occur there based on the long-term faunal survey that is the heart of this program. The known and newly discovered species include many odd "living fossil" species unlike anything known from the rest of the world, as well as many species that are closely related to species in other now-distant southern temperate areas, especially of New Zealand and Chile (each the subject of similar surveys). Research focuses on the discovery and detailed study of these species of special phylogenetic and biogeographic interest, with the aim of answering questions about the origin and early diversification of the group as a whole and the relative importance of continental drift versus dispersal in explaining "southern connections" found in many groups of plants and animals and especially common in these beetles. The program, begun in 1980 and continued most recently with two months of field work in Tasmania and southeastern Australia in early 1993, has been funded by the National Geographic Society, Australian Biological Resources Study, American Philosophical Society and Field Museum, with extensive cooperation and logistic support from CSIRO's Division of Entomology, home of the Australian National Insect Collection in Canberra.

AUSTRALIA—Biodiversity and Biomechanics of the Wrasses in the Coral Sea—Mark W. Westneat, Zoology—Field work in the Coral Sea of Australia is aimed at sampling the biodiversity of this pristine coral reef environment as well as to obtain critical specimens of wrasses, family Labridae, for phylogenetic and biomechanical studies. Labrid fishes are primarily circumtropical inhabitants of coral reefs. There are species of labrid not well represented in Museum collections which are crucial for this phylogenetic studies of this group. Films of labrids swimming were made which will be analyzed at the Field Museum in order to learn about the biomechanics and evolution of pectoral fin locomotion. Additionally, tunas and mackerals were collected and dissected for other biomechanical studies of swimming and evolution of fish design. Melina Hale, University of Chicago, and student at the Field Museum, also participated in the expedition in order to collect and study sea horses and pipefishes. Ms. Hale is investigating the evolution of tail bending in pipefishes and sea horses.

NEW ZEALAND—Flora of New Zealand—John J. Engel, Botany—Both the uniqueness of the New Zealand hepatic flora and its richness are characteristics that give it broad interest. No other region of the globe as limited in size as New Zealand possesses a comparably diverse and rich hepatic flora. No other area with corresponding dimensions shows higher levels of endemics at both genus and species level, and the endemics include some of the most isolated and unusual genera extant in the world's flora. A significant factor in the uniqueness of the New Zealand flora is due to isolation—it separated from its proximity to Gondwanaland some 80 million years ago yet preserves rich elements of the Gondwana flora. The flora program is an integral component of biodiversity studies involving New Zealand bryophytes and the beetle fauna. This interdisciplinary study, with Field Museum staff members, Alfred F. Newton and Margaret Thayer, seeks to document areas and zones of taxa richness of these two diverse groups, and attempts to identify the underlying patterns relevant to that richness.

CHINA—Wood-Rotting Basidiomycetous Fungi of Southwestern China—Qiuxin Wu, Botany—The flora of southwestern China is known for its rich biodiversity, but fungal specimens of this area are generally under-represented in western museums. Previous studies have focused on comparative morphology and genetic diversity of the white-rot genus *Clavicornia* using materials obtained from China, Central America, Europe, Japan, New Zealand and North America. Intercompatibility was found among populations in different continents, whereas isozyme variation among and within species was associated with morphological differentiation, geographic isolation and incompatibility. For this study, more specimens and systematic data from China, especially the southwestern area, are needed. Future research goals include an inventory of wood-rotting basidiomycetous fungi of south west China and genetic diversity studies on select groups.

HAWAIIAN ISLANDS—Systematics and Evolution of the Endemic Hawaiian Lobelioideae—Thomas G. Lammers, Botany —The Hawaiian Islands harbor almost 1,000 species of flowering plants, 90% of which occur nowhere else in the world. These 900 endemic species ultimately trace to just 200 original colonizations of the islands by plants from continental areas; the "extra" species are the result of evolutionary diversification from these original colonists. The group with the greatest degree of diversification is the Lobelioideae, with nearly 100 species derived from a single ancestral stock. They are thus the Darwin's finches of the plant world, and study of their relationships and evolutionary history will shed important light on the processes by which continental species invade and diversify in oceanic island systems.

MALAYSIA—Training and Research on Mammalian Diversity in Malaysian Borneo—Lawrence R. Heaney, Zoology—Malaysian Borneo (Sarawak and Sabah) supports one of the largest tracts of tropical forest in the world. However, that forest is being removed rapidly for timber and agricultural production. The impact on the rich mammalian fauna is largely unknown, and few Malaysian biologists are conducting basic research on the potential conservation problems. This project is oriented toward developing both the essential information and research capabilities at the appropriate regional universities. Studies of island biogeography and elevational diversity gradients are being conducted in collaboration with a faculty member from one of the universities who is now based at the Field Museum and studying for a Ph.D. at the University of Illinois at Chicago.

MALAYSIA: SARAWAK—Variability and Harvest Sustainability of Anti-HIV Compounds in a Natural Population of *Calophyllum*—Marian R. Kadushin and Djaja Djendoel Soejarto (Research Associate, Botany) and University of Illinois at Chicago—With the discovery of anti-HIV compounds calanolide A and costatolide from two different species of *Calophyllum* from the tropical rain forests of Sarawak, East Malaysia, a study was initiated early in 1993 to investigate the variability of the occurrence of these compounds in natural populations, as well as their seasonal variability. In partnership with the National Cancer Institute and Sarawak Forest Department the goal is to determine the optimal harvesting time, and its harvest sustainability. Samples of stem bark exudate from various numbered trees are collected periodically in the field for biological testing and chromatographic evaluation in the laboratory. Preliminary data indicate that costatolide is very stable and samples harvested six months after the first still contain the compound, without any decrease in its anti-HIV potency, *in vitro*. Other related studies being undertaken are estimating population density and species abundance of the anti-HIV-containing *Calophyllum* species.

MALAYSIA: SABAH—Structure and Organization of Communities of Amphibians in Rain Forests of Borneo—Robert F. Inger and Harold K. Voris, Zoology—This program seeks to analyze the composition, structure and variation of amphibian communities, with attention given to local and regional diversity as well as to patterns of variation over time and from place to place. Both larvae and adults are being studied. This is a long term program, which has provided a unique opportunity to examine changes in these communities. Two major conclusions have resulted so far: i) at any given locality, differences in characteristics between communities along different streams is equivalent to differences within those communities over the time span (up to 22 years) of our observations; ii) regional differences in community characteristics are largely attributable to topography, which controls stream quality. One of the offshoots of this program is analysis of the effects of logging on amphibian populations. Two of the field sites have areas that have been logged. Comparison of amphibians in logged and pristine sections provide an opportunity to estimate the effects of logging without the complication of distance.

MALAYSIA: SABAH—Systematics, Evolution and Ecology of Frogs in Borneo—Robert F. Inger, Zoology—Sampling of amphibians in Southeast Asia generally has been sporadic and unorganized. This program, by concentrating on Borneo, has provided a baseline for an amphibian fauna in that part of the world. Collecting of specimens and data has been systematized allowing comparisons of regions (and communities, see above) within Borneo. This sampling program has provided the basis for estimates of local as well as regional diversity, for discovery of new species, for associations of larvae with adults, for analyzing partitioning of resources, and for phylogenetic studies. Now underway is a study of patterns of development and life strategies and the association of those patterns with phylogenetic relations. Populations of adults and tadpoles have also been monitored for two years in two national parks in Sabah, Malaysia (northern Borneo). Implantation of passive transponders in adult frogs has made possible long term, certain identification of individuals for the first time. Monitoring the tadpoles will provide fundamental data needed to evaluate the chances for survival of populations following logging (see above), for there is an interval between logging and the stabilization of soil by plants that may determine survival.

MALAYSIA: SABAH—Ecology of Marine Snakes—Harold K. Voris, Zoology—In the Pulau Tiga Marine Park off the north coast of Borneo, Rob Stuebing, Research Associate in Sabah, Malaysia, and I, along with several students are exploring the population ecology of the banded sea krait (*Laticauda columbrina*), an amphibious sea snake. We have made estimates of population size and the age/sex composition of the population. Our plan is to investigate the plasticity in several life history traits over its huge geographic range that straddles the equator.

PHILIPPINES—Inventory of a Palawan Forest—Djaja Djendoel Soejarto (Research Associate, Botany) and University of Illinois at Chicago—In an attempt to quantify data on the potential medical value of a tropical rain forest tract, a 1-hectare plot was set down in a lowland mixed forest on the eastern slope of Mt. Beaufort of Central Palawan. Plant samples were collected from this plot for testing against cancer cell lines and HIV. Based on the species-area curve of tree species with a diameter of 10 cm and above found in the 1-Ha plot, an estimate will be made through extrapolation on the number of species of potential importance to yield anticancer and anti-HIV drugs, in the entire 5,000-6,000 hectares forest tract in Central Palawan. Such information should strengthen the justification for further conserving these forests, as well as for utilizing them in a sustainable manner. This project is on going with the cooperation of the Philippine National Herbarium (PNH), Manila, and the Palawan Integrated Area Development Project Office (PIADPO) in Palawan, and in partnership with the National Cancer Institute's plant collection project at the University of Illinois at Chicago.

PHILIPPINES—Field Studies and Database on the Flora of Palawan—Djaja Djendoel Soejarto (Research Associate, Botany) and University of Illinois at Chicago—Palawan Island, the fifth largest island in the Philippines with an area of approximately 10,000 sq km, is the only large island of this archipelagic nation still more than half covered by good tropical rain forests. There is an interest on the part of the Philippine Government to develop these forests in a sustainable manner for the well-being of the people of Palawan and the Philippines. One important step toward the sustainable utilization and development of forest resources is to know the plants that grow in these forests. Towards this goal, a plant collecting program has been undertaken yearly on this island since 1988. New collections are incorporated into a database of the Palawan flora in deposit at the herbaria of the Philippine National Herbarium and the Field Museum of Natural History. At the moment, this database contains more than 6,000 records, comprising at least 1,000 species of angiosperms. This database provides us with information on endemic taxa, taxa extensively collected, taxa rarely collected or perhaps of rare occurrence, etc., which should be useful in any planning for the conservation for sustainable utilization and development of Palawan forests. It should also provide a foundation for the writing of a checklist and, eventually, a flora of Palawan. This project is on-going in partnership with the Philippine National Herbarium (PNH), Manila, and the National Cancer Institute's plant collection project at the University of Illinois at Chicago.

PHILIPPINES—Birds of Sibuyan Island, Philippines—Steven M. Goodman and David E. Willard, Zoology—Sibuyan Island, a very small island in the Sibuyan Sea south of Luzon, has never been thoroughly explored ornithologically. Early surveys were restricted to its periphery with none covering the steep slopes of Mt. Guitinguitin which dominates the island's center. Because Sibuyan is an oceanic island with no history of connections to other islands or any mainland area, baseline information on its avifauna is important for understanding the biogeographic patterns and declining bird diversity of the Philippines as a whole.

PHILIPPINES—Assessment and Conservation of Mammalian Biodiversity—Lawrence R. Heaney, Zoology—With 115 species of mammals restricted to the Philippines, along with the additional 65 that occur in other countries as well, this island nation is home to one of the richest endemic mammalian faunas in the world. However, it is also one of the least known faunas; 20 species have been discovered in the last 10 years, a rate of discovery of new species that equals any continent. Working with colleagues from five Philippine institutions over the last 12 years, this project has provided the first modern assessment of patterns of mammalian distribution, including the definition of major biotic regions, the impact of diversity gradients along elevational gradients on biodiversity patterns, and study of the ecology of many rare and poorly-known species. The results of this research are now being used by the Philippine government in their effort to rejuvenate their national park system, which had been decimated during the Marcos years. The on going Integrated Protected Areas Project, now supported by a \$20 million grant from the Global Environmental Fund of the World Bank, uses recommendations from this project as one of their primary guidelines. As a result, the prospects for the survival of this unique array of species has gone from exceedingly dim to guardedly positive, and they continue to improve.

PHILIPPINES—Training and Program Development in the Conservation of Biodiversity—Lawrence R. Heaney, Zoology—Although the Philippines once was clothed in rich tropical forest, about 80% of that forest has been cleared, imperiling the rich native fauna and flora. Moreover, loss of the forest, with its natural ability to absorb the water produced by the many typhoons each year, also represents loss of watersheds that control flooding, erosion, dam siltation, and coral reef siltation. This project, in partnership with the MacArthur Foundation, sought to respond to this problem by improving the capacity of Philippine institutions to conduct basic biodiversity research, to improve facilities for research and teaching, and to increase training opportunities for conservation biologists. The program included advanced training in field research techniques for young faculty in the Philippines, more advanced and intensive training at Field Museum, support of national symposia and workshops on biodiversity and conservation, and direct funding for development of educational and research programs at several Philippine institutions.

SOUTHEAST ASIA—Plant Collecting Program—Djaja Djendoel Soejarto (Research Associate, Botany) and University of Illinois at Chicago and Charlotte Gyllenhaal, University of Illinois at Chicago—A plant collecting program was initiated in Southeast Asia in 1986 under the auspices of the United States National Cancer Institute (NCI) partnership with the University of Illinois at Chicago, using the University of Illinois at Chicago and the Botany Department of the Field Museum as a base of operation. The Arnold Arboretum of Harvard University, the Department of Botany of Bishop Museum and the Rijksherbarium (Leiden, the Netherlands) are also cooperating in this project. In addition, the project receives the cooperation of all major botanical (host) institutions in Southeast Asia (Bangladesh east to Papua New Guinea, through the Gulf of Thailand States and Malesia), where collecting work is being undertaken. Although the primary goal of the project is the collection of plant samples for anticancer and anti-HIV evaluations, all samples are fully documented by voucher herbarium specimens. General collecting throughout Southeast Asia is also undertaken as part of the field work operations. Thousands of plant species, in particular angiosperms, have been collected as part of this project. Duplicates of all collections are deposited at the John G. Searle Herbarium, Field Museum, as well as in each host herbarium institution and in other collaborating botanical institutions. From the botanical point of view, the importance of the project is to contribute new data and to enrich the database of herbarium collections from Southeast Asia, and will be useful in increasing our knowledge on the flora and forests of Southeast Asia.

SOUTHEAST ASIA—Coevolution of Pedunculate Barnacles and Decapod Crustaceans—Harold K. Voris, Zoology—In the Straits of Johore between Malaysia and Singapore and in Thailand, William Jeffries, Research Associate from Dickinson College, Yang Chang Man, Research Associate from Singapore, and I are trying to understand the degree to which coevolution has occurred in a symbiotic relationship that exists between pedunculate barnacles, on the one hand, and crabs and snakes, on the other. Recently our work on the mechanisms of colonization of the edible crab by barnacles was completed and we are now looking at timing factors. This program has evolved out of my earlier systematics studies of marine snakes.

SOUTHEAST ASIA—Evolution of Homalopsine Snakes—Harold K. Voris, Zoology—Homalopsine snakes are aquatic snakes that live in brackish tidal water and in freshwater. Ecologically they form a bridge between truly marine snakes and ordinary freshwater snakes. They are important predators in the biologically very rich tidal zones of Southeast Asia and adjacent islands. As they are taxonomically very diverse yet almost unknown phylogenetically, these snakes are important to both ecological and evolutionary studies. This program has two aspects. One is a straight forward study of the snake morphology and biochemical analyses. The other is an investigation of the population ecology of species that live in rice fields and buffalo wallows in Sabah, Malaysia (northern Borneo). Field work has involved marking snakes by implanting passive transponders with the goals of estimating numbers and movements of individuals. Although the environment in which this program takes place is extreme (high temperatures, occasional drought, etc.), a surprising diversity of aquatic and semi-aquatic organisms utilize it. This program is being conducted with Daryl Karns, Field Associate from Hanover College and John Murphy, teacher and Field Associate. It has also benefitted from the help of high-school student interns who have worked in the Amphibians and Reptiles collection during the last two summers.

TAIWAN—Botanical Inventory of Taiwan—Thomas G. Lammers, Botany—This project includes representatives from all major botanical institutions in the United States and the Republic of China (ROC) and is headquartered at the Missouri Botanical Garden in St. Louis and Academia Sinica in Taipei. Its two major goals are i) to develop a computerized database incorporating pertinent nomenclatural information (i.e., accepted name, synonymy, places of publication, vernacular names) for all Taiwanese species, as well as specimen label data from major herbaria in Asia, Europe, and North America; and ii) to develop an ongoing collecting program on the island. The American members of the project spent the month of September 1991 in Taiwan, familiarizing themselves with both the native flora and the scientific infrastructure of the country. In March 1992, a two-day symposium entitled "Phytogeography and Botanical Inventory of Taiwan" was held at the Institute of Botany, Academia Sinica, with support from that institution, the National Academy of Sciences (USA), and the Committee for Scientific and Scholarly Cooperation with the USA (ROC).

TROPICAL ASIA—Distribution of Amphibians of Southern Asia—Robert F. Inger, Zoology—The amphibian fauna of southern Asia, from India to the Philippines and the Lesser Sundas, has long been known as one of the major tropical faunas. However, it has been studied only in terms of its component political subdivisions. This is the first attempt at an analysis considering the fauna as a whole. There are clearly two major geographic components, defined essentially by pre-Tertiary geologic history: i) India/Sri Lanka, and ii) all the rest. Overlap between these two major components is accounted for mainly by species that are commensals of man, weed species that tolerate extreme environmental disturbance. The India/Sri Lanka portion, which excludes the mountainous northeastern part of India, has all the attributes of a Gondwana fauna with endemic genera and subgeneric lineages with clear African relationships. Southeastern Asia, from Burma to Borneo and the Philippines, has a single distinct fauna with a few subregional endemic lineages but with subregions defined by physiographic boundaries and many endemic species.

PACIFIC and INDIAN OCEANS—Biodiversity and Systematics of 'lower heterobranch' Snails—Rüdiger Bieler, Zoology—This project focuses on the evolution of gastropods, specifically the 'lower heterobranchs,' a group of marine snail families. These are of interest due to their unusual anatomical features and still uncertain relationships to other snail groups. Their long-range larval distribution and excellent fossil record also allow us to address general biological questions such as: How does a high-dispersal marine invertebrate animal speciate? Extensive field collecting by SCUBA diving and deep-water dredging has been completed in South Africa and the Hawaiian Islands, and will be continued in Western Australia in 1994. The project is currently being expanded into a combined anatomical/molecular study by adding DNA sequence studies.

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- Wu, Q.-X., 1991. Systematics in the genus *Clavicornia* (Basidiomycotina, fungi): morphology, incompatibility and phenoloxidase isozymes (Ph. D. dissertation). University of Tennessee. pp. 203.

For Additional Information Contact:

Peter R. Crane, Vice President, Academic Affairs, The Field Museum, Chicago, IL 60605-2496
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FRED R. BARRIE

Visiting Assistant Curator, Vascular Plants, Department of Botany, Field Museum; Assistant Curator, Missouri Botanical Garden, St. Louis.

B.G.S., University of Michigan, 1976.

B.S., Biology, Metropolitan State College, Denver, 1979.

M.S., Botany, Washington State University, 1981.

Ph.D., Botany, University of Texas at Austin, 1990.

Research Fellow, Department of Botany, The Natural History Museum, London.

Secretary, Special Committee on Lectotypification of the XVth International Botanical Congress.

Editorial Committee, The International Code of Botanical Nomenclature.

Botanical Curator and member of the Curatorial Collections Committee, The Linnean Society of London, 1990-1993.

Systematics of *Valeriana*, particularly New World; Mesoamerican Floristics; Botanical Nomenclature; Typification of Linnaean and other 18th Century plant names.

Research includes studies of the systematics of the genus *Valeriana* and other Valerianaceae, particularly in the New World, and the Flora Mesoamericana Project. A collaborative venture of the Missouri Botanical Garden, the Universidad Autónoma de México and the Natural History Museum, London, the Project is producing a modern, comprehensive flora for Panama, Central America and México east of Oaxaca and Veracruz. Volumes one (pteridophytes) and six (monocots) will be published in 1994, the other four volumes by 1998. The Searle Herbarium is a vital resource for any floristic account of mesoamerica, as it contains one of the largest and most comprehensive mesoamerican plant collections.

Just prior to arriving here, I spent five years at the Natural History Museum, London, collaborating with Dr. Charles Jarvis on the Linnaean Plant Name Typification Project. The Linnaean Project's goal is to identify, evaluate and catalogue the potential type material for the 10,000 plant names published by Carl Linnaeus. The results will appear in an annotated catalogue and in a computerized database which will be available on-line. In 1993, we published a list of the 1300 Linnaean generic names and their types, including the first effective typifications for 451 names.

* * *

1989. The neotypification of *Valeriana scandens* L. (Valerianaceae). Taxon 38: 296-298.

1989. Two new species of *Valeriana* (Valerianaceae) from Cerro de Teotepic, Guerrero, Mexico. Sida 13: 265-272.

1991. (with J. L. Reveal and C. E. Jarvis) Proposals to permit the designation of an authenticating element to allow the precise interpretation of an ambiguous type. Taxon 40: 667-668.

1993. (with L. J. Dorr) Typification of Linnaean names in *Pyrola* (Ericaceae, Pyroloideae). Brittonia 45: 177-180.

1993. (with C. E. Jarvis, D. M. Allan and J. L. Reveal) A list of Linnaean generic names and their types. Regnum Vegetabile 127: 1-100.

1994. (with W. Greuter, H. M. Burdet, W. G., Chaloner, V. Demoulin, D. L. Hawksworth, P. M. Jørgensen, J. McNeill, D. H. Nicolson, P. C. Silva and P. Treharne) (eds.) The International Code of Botanical Nomenclature, Adopted by the Fifteenth International Botanical Congress, Yokohama, August—September 1993. Regnum Vegetabile.

RÜDIGER BIELER

Associate Curator and Head, Invertebrates, Department of Zoology, Field Museum; Lecturer, Committee on Evolutionary Biology and Biological Sciences Collegiate Division, University of Chicago

M.Sc., Biology, Geography and Biology-Education, University of Hamburg, 1982.
Ph.D., Zoology, University of Hamburg, 1985.

Research Associate of Malacology, Museum of Comparative Zoology, Harvard University
Vice President, American Malacological Union
Secretary, Council of Systematic Malacologists
Editor-in-Chief, Monographs of Marine Mollusca, Nemouria
Scientific Editor, Smithsonian Institution Translations Publishing Program
Editorial Board Member: Malacologia, International Journal of Malacology;
Malacological Review; The Nautilus
Coordinating Author, Treatise on Invertebrate Paleontology
Trustee, Board of Directors, Delaware Museum of Natural History

Evolutionary biology of mollusks, especially Gastropods.

Research concentrates on the evolution, comparative anatomy, zoogeography and reproductive biology of gastropods (snails). Emphasis is placed on the currently unresolved "higher-level" phylogenetic relationships between various gastropod orders and subclasses. How are the marine shell-bearing snails, the sea slugs and the land snails interrelated? Where do they come from? Does the fossil record corroborate our hypotheses? Data are collected by employing a combination of field and laboratory techniques (ranging from collecting by SCUBA diving to serial-section histology and electron microscopy), and are derived in part from Field Museum's extensive holdings of Recent and fossil mollusks. More narrowly defined subprojects deal with a group of marine snail families called "Heterostropha." These are not only of interest due to their unusual anatomical features and still uncertain relationships to other snail groups, but their long-range larval distribution and excellent fossil record also allows to address general biological questions such as: How does a high-dispersal marine invertebrate animal speciate? Also continuing is monographic work on worm-snails (an enigmatic group that includes important reef builders in the world's oceans), forming the basis for future phylogenetic and zoogeographic studies.

* * *

1988. Phylogenetic relationships in the gastropod family Architectonicidae, with notes on the family Mathildidae (Allogastropoda). Malacological Review, Supplement 4: 205-240.

1990. (with K. J. Eckelbarger & P. M. Mikkelsen) Ultrastructure of sperm development and mature sperm morphology in three species of commensal bivalves (Mollusca: Galeommatoidea). Journal of Morphology 205: 63-75.

1992. Gastropod phylogeny and systematics. Annual Review of Ecology and Systematics 23: 311-338.

1992. (with P. M. Mikkelsen) Biology and comparative anatomy of three new species of commensal Galeommatidae, with a possible case of mating behavior in bivalves. Malacologia 34:1-24.

1992. (with P. M. Mikkelsen) (eds.) Handbook of Systematic Malacology. Parts 1-2. Smithsonian Institution and National Science Foundation, 1189 pp. (Annotated English-language edition of Thiele, J., Handbuch der systematischen Weichtierkunde Teile 1-2).

1993. Architectonicidae of the Indo-Pacific (Mollusca: Gastropoda). Abhandlungen des Naturwissenschaftlichen Vereins in Hamburg/Stuttgart (NF) 30: 1-376 New York: G. Fischer Verlag.

JOHN R. BOLT

Curator, Fossil Reptiles and Amphibians, Department of Geology, Field Museum; Lecturer, Committee on Evolutionary Biology, University of Chicago; Associate Professor, University of Illinois at Chicago

B.S., Geology, Michigan State University, 1962.

Ph.D., Paleozoology, University of Chicago, 1968.

Chair, Department of Geology, Field Museum of Natural History, 1981-1990.

Early diversification of tetrapods, particularly amphibians, of Mississippian, Pennsylvanian, and Early Permian age (ca. 360 to 270 million years before present)/systematics/comparative and functional morphology/biogeography.

Current studies are focused on: i) Relationships and morphology of primitive amphibians (as well as fish) from a new Mississippian (ca. 335 million years before present) locality in southeastern Iowa. The locality has produced hundreds of specimens of the oldest tetrapods known from continental North America. Complete specimen preparation will require several years. ii) Fossil evidence for the origin and early evolution of the tetrapod auditory system, and its implications for otic evolution as well as tetrapod relationships. iii) Origin and early evolution of the living amphibians (lissamphibians). I am interested in supervising student research on systematics, morphology, and biogeography of Paleozoic reptiles and amphibians.

* * *

1983. (with A. de Ricqles) Jaw growth and tooth replacement in *Captorhinus aguti* (Reptilia: Captorhinomorpha): a morphological and histological analysis. Journal of Vertebrate Paleontology 3: 7-24.

1983. (with R. DeMar) Simultaneous tooth replacement in *Euryodus* and *Cardiocephalus* (Amphibia: Microsauria). Journal of Paleontology 57: 911-923.

1985. (with R. E. Lombard) Evolution of the amphibian tympanic ear and the origin of frogs. Biological Journal of the Linnean Society 24: 83-99.

1988. (with R. E. Lombard) Evolution of the stapes in Paleozoic tetrapods: conservative and radical hypotheses. pp. 37-67. In: B. Fritzsch, M. J. Ryan, W. Wilczynski, T. E. Hetherington, and W. Walkowiak (eds.), The Evolution of the Amphibian Auditory System. John Wiley and Sons, Inc.

1988. (with R. M. McKay, B. J. Witzke, and M. P. McAdams) A new Lower Carboniferous tetrapod locality in Iowa. Nature 333: 768-770.

1990. Tetrapods and fish from a recently-discovered Middle Mississippian locality in Iowa. National Geographic Research 6: 339-354.

1991. Lissamphibian origins. In: Tetrapod Origins, H. -P. Schultze and L. Trueb (eds.). Cornell University Press.

1992. (with R. E. Lombard) Nature and quality of the fossil evidence for otic evolution in early tetrapods. pp. 377-403. In: A. Popper, R. Fay, and D. Webster (eds.), The Evolutionary Biology of Hearing, Springer Verlag.

1993. (with H.-P. Schultze) The lungfish *Tranodis* and the tetrapod fauna from Upper Mississippian deposits of North America. Palaeontology (in press).

WILLIAM C. BURGER

Curator, Vascular Plants, Department of Botany, Field Museum;

B.A., Columbia University, 1953.

M.Sc., Cornell University, 1958.

Ph.D., Washington University, 1961.

Chair, Department of Botany, Field Museum of Natural History, 1978-1985.

Flora of Costa Rica/speciation and species richness in Costa Rican flowering plants/early evolution of angiosperms and processes of angiosperm diversification.

The Flora Costaricensis is an encyclopedia-like review of the native and naturalized plants of Costa Rica, with keys, illustrations, descriptions and short discussions. It is published in parts, each covering a single large family or several smaller families. The work attempts to define and characterize the species and facilitate user identification.

The flowering plants of Costa Rica probably number close to 10,000 species, packed into an area about the size of West Virginia. Taxonomic review of many unrelated families has disclosed repeated geographic and altitudinal patterns, while making it clear that closely related species rarely grow in the same habitat. Analysis of these patterns may give us insights into the speciation processes that have helped produce so rich a flora.

The early evolution of angiosperms is poorly understood, while the origin of angiosperms is still as much an "abominable mystery" as when Darwin so described it. Current thinking about early angiosperm evolution continues a tradition of more than 50 years and is virtually unanimous. By exploring radically different scenarios it may be possible to develop new insights into early morphological trends, or at least challenge the confidence of current thinking in the field.

* * *

1978. The Piperales and the monocots: alternate hypotheses for the origin of monocotyledonous flowers. Botanical Review 43: 345-393.

1981. Heresy revived: the monocot theory of angiosperm origin. Evolutionary Theory 5: 189-225.

1985. Why are there so many kinds of flowering plants in Costa Rica? In: The Botany and Natural History of Panama, W.G. D'Arcy and M.D. Correa, (eds.), pp. 125-136.

1989. Tropical forests and the number of plants and animals on planet earth. Field Museum Bulletin 1: 8-14.

1990. (with H. van der Werff) Flora Costaricensis: Lauraceae and Hernandiaceae, families 80 and 81. Fieldiana: Botany, n.s. 23: 1-138.

1992. Parapatric close-congeners in Costa Rica: Hypotheses for pathogen-mediated plant distribution and speciation. Biotropica 24: 567-578.

1993. (with Carlotta Taylor) Flora Costaricensis: Rubiaceae, Family 202. Fieldiana: Botany n.s. 33: 1-333.

IGNACIO CASANOVA

Interim Curator, Meteoritics and Mineralogy, Department of Geology, Field Museum; Research Associate, Department of Geophysical Sciences, University of Chicago

B.S., Geology, University of Barcelona, 1986.

M.S., Geology, University of Barcelona, 1988.

Ph.D., Geology, University of New Mexico, 1990.

Research Prize, CIRIT, Catalonian Government, 1987.

Award, NASA Jet Propulsion Laboratory, 1989-1991.

Research Associate, U.S. National Academy of Sciences and NASA, Johnson Space Center, 1990-1992.

Meteoritics and Mineralogy.

Meteorites have preserved many of the original signatures of the conditions that reigned 4.6 billion years ago in our solar system and, therefore, are samples of unique scientific importance. The analysis of their metallic minerals provides important insights about the early evolution of the planets and the chemical compositions of their otherwise inaccessible interiors. Meteorite research in the Field Museum is carried out in collaboration with the University of Chicago and addresses a variety of topics, including the characterization of new specimens, the study of primordial inclusions in carbonaceous chondrites, the mineralogy and geochemistry of meteoritic metal, and the isotopic composition of meteoritic and planetary materials. This involves the study of a wide variety of specimens with sophisticated tools like the electron and optical microscopes, mass spectrometers, X-ray microanalyzers, high-temperature furnaces and image processing systems. My current research includes the characterization of unique silicate inclusions in the Colomera and Watson iron meteorites, the study of the stability of rare minerals like perryite (nickel silicide) and osbornite (titanium nitride), the mineralogy and crystal chemistry of silicon-bearing meteoritic metal, and the geochemistry of ultra refractory inclusions in carbonaceous chondrites.

The Field Museum holds one of the world's largest, best documented and accessible meteorite collections. The research and sample preparation facilities of the Department of Geology offer an excellent setting for the systematic study of meteorites and minerals. Our close cooperation with the Adler Planetarium and the University of Chicago provides a unique environment for Meteoritics and Planetary Science research and education.

* * *

1986. (with E. A. King, A. San Miguel, K. Keil) Inventory of the meteorite collection of the Museo Nacional de Ciencias Naturales, C.S.I.C., Madrid, Spain. Meteoritics 21: 193-197.

1987. (with A. San Miguel) Heterogeneity and metamorphic processes in ordinary chondrites: evidences from a study of Spanish meteorites. In: II Congreso Geoquímica España pp. 337-339.

1990. (with K. Keil, R. Wieler, A. San Miguel and E. A. King) Origin and history of chondrite regolith, fragmental and impact-melt breccias from Spain. Meteoritics 25: 127-135.

1991. Geochemistry and origin of metal in aubrites. Lunar and Planetary Science XXII: 185-186.

1992. (with L. J. Perdiguero) Relationships between chondritic and iron meteorites. In: IV Congreso Geoquímica de España pp. 865-872.

BARRY CHERNOFF

Associate Curator, Fishes, Chair, Department of Zoology, Field Museum; Lecturer, Committee on Evolutionary Biology, University of Chicago; Adjunct Professor of Neotropical Zoology, Universidad Central de Venezuela

B.A., State University of New York at Stony Brook, 1973.

M.A., Adelphi University, 1976.

Ph.D., University of Michigan, 1983.

Board of Governors, American Society of Ichthyology and Herpetology, 1985-1989, 1991-1996.

Governing Council, Society of Systematic Biology, 1993-1997.

Visiting Professor of Neotropical Zoology, Universidad Central de Venezuela, 1988.

Book Review Editor, Systematic Zoology, 1987-1989.

Systematic biology of South American freshwater fishes and silverside fishes of the world/morphometrics/morphological evolution/systematics/biogeography.

My research is concerned with understanding the patterns and processes involved in morphological evolution. To do this, I integrate phylogenetic studies of fishes with morphometric studies of development in an attempt to evaluate current evolutionary theories. The fishes that I focus on are silverside fishes of the world (Atheriniformes) and the selected groups of characiform fishes that live in the fresh waters of South America. These fishes offer an unusual opportunity to study morphological evolution across a variety of habitats and environments. The morphologies of these fishes are often highly influenced by the habitats within which they live. Part of my research focus, therefore, is to elucidate the patterns of morphological diversity that are due to phylogenetic (historical) factors and the patterns that are due to environmental influences. These studies emphasize general questions about morphological evolution, such as the evolution of complexity, character stasis and the relationship between genetic and developmental evolutionary models.

I would be pleased to supervise students interested in applying developmental, morphological or biochemical data to the resolution of interesting questions in fish evolution and systematics or pursuing projects on morphological evolution in other organisms. The Field Museum has excellent collections of recent fishes, with strong emphases on neotropical freshwater fishes as well as biochemical and morphometrics/image analysis laboratories for use in systematic and evolutionary studies.

* * *

1985. (with F. L. Bookstein, R. L. Elder, J. M. Humphries, G. R. Smith and R. E. Strauss) Morphometrics in Evolutionary Biology. The Geometry of Size and Shape Change, with Examples from Fishes. Academy of Natural Sciences Special Publication No. 15: 1-277

1990. (with A. Machado). Characid fishes of the genus *Ceratobranchia*, with descriptions of new species from Venezuela and Peru. Proceedings of the Academy of Natural Sciences, Philadelphia 142: 261-290.

1991. (with A. Machado and W. G. Saul) Redescription of *Leporinus brunneus* Myers (Characiformes: Anostomidae) with a biogeographic analysis of the fish fauna of the Upper Rio Orinoco. Ichthyological Explorations of Freshwaters 2 (1): 295-306.

1992. (with J. G. Lundberg) A Miocene fossil of the amazonian fish *Arapaima* (Teleostei, Arapaimidae) from the Magdalena River region of Colombia — biogeographic and evolutionary implications. Biotropica 24 (1): 2-14.

1993. (with A. Machado, P. A. Buckup, and R. Royero). Las especies del genero *byconops* Kner, 1858 en Venezuela. Acta Biologica Venezuelica 14(3): 1-20.

1994. (with A. Machado, P. A. Buckup, and R. Royero) Systematic status and neotype designation of *Autanichthys giacopinii* Fernandez-Yepez with comments on the morphology of *Bryconops melanurus* (Bloch). Copeia 1994 (1): 238-242.

PETER R. CRANE

Vice President, Academic Affairs and MacArthur Curator, Departments of Botany and Geology, Field Museum; Professor, Department of the Geophysical Sciences, University of Chicago; Lecturer, Committee on Evolutionary Biology, University of Chicago

B.Sc., Botany, University of Reading, 1975.

Ph.D., Paleobotany, University of Reading, 1981.

Post-doctoral Research Scholar, Indiana University.

Schuchert Award, Paleontological Society, 1993

Bicentenary Medal of the Linnean Society of London, 1984.

Visiting Professor, Botanischer Garten und Institut für Systematische Botanik der Universität Zürich, 1987.

Visiting Professor, Botany Department, University of Massachusetts, 1989.

Visiting Research Fellow, The Natural History Museum, London, U.K.

Editorial Board, Review of Paleobotany and Palynology.

Editor, Paleobiology, 1984-1986.

Paleobotany of land plants, particularly the origin and early evolution of angiosperms.

My research focuses on the paleobotany of land plants and the application of paleobotanical data to understanding large-scale phylogenetic and macroevolutionary patterns in the Plant Kingdom. The early evolution of angiosperms and associated patterns of Cretaceous vegetational change continue to be my primary interest. Other areas of ongoing research include the initial diversification of land plants, the origin of seed plant biology and evolution of water-conducting tissues. Recent work involved field studies in eastern North America, central Portugal and Ecuador has recovered well-preserved microscopic flowers of early angiosperms and related plants from the mid-Cretaceous (about 100 myr B.P.). Scanning electron microscopy of this material is providing morphological and systematic data, as well as insights into pollination and other aspects of reproductive biology in early angiosperms. Studies of pollen grains preserved *in situ* within flowers also provide a more secure basis for ecological interpretations of the fossil palynological record. These studies and associated syntheses of Cretaceous palynological data currently underway at the Field Museum are designed to improve our understanding of the large-scale biotic and environmental changes that occurred during the critical mid-Cretaceous phase of Earth history.

I will be pleased to supervise students interested in the higher-level systematics and phylogeny of extant or fossil plants, or who wish to apply paleobotanical data to interesting questions in plant evolution or vegetational history. The Field Museum has excellent collections of extant and fossil plants, as well as appropriate biochemical and morphometrics/image analysis laboratories.

* * *

1985. Phylogenetic analysis of seed plants and the origin of angiosperms. Annals of the Missouri Botanical Garden, 72: 716-793.

1987. (with E. M. Friis and W. G. Chaloner) (eds.) The Origins of Angiosperms and their Biological Consequences. Cambridge: Cambridge University Press, x + 337 pp.

1989. (with S. Blackmore) (eds.) Evolution, Systematics and Fossil History of the Hamamelidaceae. Volumes 1 & 2. Oxford: Oxford University Press.

1989. Patterns of evolution and extinction in vascular plants. In: Evolution and the Fossil Record, K.C. Allen and D.E.G. Briggs (eds.), pp. 154-187. Belhaven Press.

1989. (with S.H. Lidgard) Paleolatitudinal gradients and temporal trends in Cretaceous floristic diversity. Science, 246: 675-678.

1991. (with P. Kenrick) Water-conducting cells of early fossil land plants: Implications for the early evolution of tracheophytes. Botanical Gazette 152: 335-345.

MICHAEL O. DILLON

Curator, Vascular Plants and Head, Phanerogams, Department of Botany, Field Museum; Lecturer, Committee on Evolutionary Biology, University of Chicago

B.A., University of Northern Iowa, 1969.
M.A., University of Northern Iowa, 1972.
Ph.D., University of Texas at Austin, 1976.

Visiting Professor & Curator, Beal-Darlington Herbarium, Michigan State University.
Visiting Professor, Universidad Antenor Orrego, Trujillo, Peru.
Honorary Professor, Universidad Nacional de Cajamarca, Cajamarca, Peru.
Arnold Arboretum Associate, Harvard University.
Research Associate, Missouri Botanical Garden.
Research Associate, Museo de Historia Natural "Javier Prado", Lima, Peru.

Systematics of neotropical Asteraceae and Nolanaceae; coastal South American ecology and biogeography; amphitropic disjunctions; floristic inventories, databases, and networking.

Research projects involve exploration, description, biosystematic study, and conservation of biodiversity within the Neotropics of western South America. One project studies unique plant communities (lomas formations) that exist within the hyper-arid deserts of coastal Chile and Peru; habitats that are directly influenced by the El Niño weather patterns. A decade of field studies are summarized in a specimen-oriented computerized database that will soon include color images and distribution maps. Ecological adaptations and evolutionary relationships of selected genera are under investigation. The monograph of the genus *Griselinia* and ecophysiological investigations in the Plumbaginaceae exemplify studies in which the synthesis of data from diverse sources permits the identification of biogeographic patterns as well as tests of hypotheses on the age and origin of the deserts.

With the support of the National Geographic Society, my Peruvian colleagues and I are continuing a floristic inventory of highly threatened fragments of montane forests in northern Peru that were once more continuous. We have completed a detailed inventory from one site (Bosque Monteseco) and our studies have led to new distribution records and the description of several plant and animal species new to science. These inventories will aid in conservation of the remaining habitats and will contribute to the training of young Peruvian scientists.

Studies in the Asteraceae (sunflower family) are progressing along several lines. A generic synopsis of tribe Inuleae for all of South America has recently been published, which included a detailed micro-morphological survey of 24 genera and over 200 species. The evolution of the Inuleae within the Andean Cordillera is being studied to determine how plants adapt to these demanding alpine environments. Our work on the Catalogue of the Flowering Plants and Gymnosperms of Peru was recently published and accounted for 222 genera and 1425 species of Asteraceae for Peru.

1993. Análisis florístico del Bosque Monteseco (Cajamarca, Perú) e implicancias para su conservación. Arnaldoa 1 (3):45-63.

1993. (with N. Hensold) Family Asteraceae, In L. Brako and J. L. Zarucchi. Catalogue of the Flowering Plants and Gymnosperms of Peru. Monograph in Systematic Botany Missouri Botanical Garden 45: 103-189

1993. (with M. Muñoz-Schick) A revision of the dioecious genus *Griselinia* (Griselinaceae), including a new species from the coastal Atacama Desert of northern Chile. Brittonia 45: 261-274.

1994. (with A. D. Hanson, B. Rathasabapathi, J. Rivoal, M. Burnet, and D. A. Gage). Osmoprotective compounds in the Plumbaginaceae: A natural Experiment in metabolic engineering of stress tolerance. Proceedings of the National Academy of Science. 91 (1): 306-310.

JOHN J. ENGEL

Donald R. Richards Curator, Bryology, Department of Botany, Field Museum

B.S., University of Wisconsin-Milwaukee, 1965.

M.S., University of Wisconsin-Milwaukee, 1967.

Ph.D., Michigan State University, 1972.

Council Member, International Association of Bryologists.

Chair, Department of Botany, Field Museum, 1988-1993.

Hepatic systematics and phytogeography of the south temperate and subantarctic regions.

The primary objective of my research program is to come to an understanding of hepatic systematics and phytogeography of south temperate and subantarctic regions. These geographic areas present an ideal natural laboratory to investigate biological questions relevant to evolutionary persistence, dispersibility and survival and evolution of plants faced with environmental change. Within that framework I am engaged in detailed, in-depth (monographic) studies of various groups, including *Chiloscyphus* for Australasia, *Telaranea* for Australasia and *Lepidozia* for New Zealand. My research also focuses on the "Hepaticae of the New Zealand," a three-volume work in collaboration with Dr. R. M. Schuster. Dr. Schuster is a Research Associate of Field Museum and a recent recipient of the Engler Medal, one of the highest honors to be bestowed upon a botanist. My program includes elements of biogeography, ecology, morphology and phylogeny. I am also investigating problems involving functional morphology of hepatic structures and I am doing so in a broad evolutionary context.

* * *

1980. A monograph of *Clasmatocolea* (Hepaticae). Fieldiana: Botany, n.s. 3:i-viii, 1-229.

1985. (with R. M. Schuster) Austral Hepaticae V (2). Temperate and subantarctic Schistochilaceae of Australasia. Journal of the Hattori Botanical Laboratory 58: 255-539.

1990. Falkland Island (Islas Malvinas) Hepaticae and Anthocerotae: A taxonomic and phytogeographic study. Fieldiana: Botany, n.s. 25: 1-209.

1990. Studies on Geocalycaceae. I. The taxonomic position of *Chiloscyphus amplexans* (Mitt.) Engel & Schust. together with refinements in *Heteroscyphus* Schiffn. Journal Hattori Botanical Laboratory 68: 303-315.

1991. Studies on Geocalycaceae (Hepaticae). II. *Stolonivector*, a new genus from New Zealand. Journal of the Hattori Botanical Laboratory 69: 79-86.

1991. Studies on Geocalycaceae (Hepaticae). IV. *Lamellocolea*, a new genus of Leptoscyphoideae from New Zealand. Journal of the Hattori Botanical Laboratory 70: 63-78.

1992. Studies on Geocalycaceae (Hepaticae). VIII. A revision of *Chiloscyphus* subg. *Notholophocolea* (Schust.) Engel & Schust. Journal Hattori Botanical Laboratory 72: 105-115.

1993. Index Hepaticarum Supplementum: 1986—1987. Taxon 42: 373-391

1993. Studies on Geocalycaceae. IX. *Chiloscyphus hattorii* Eng¹, a new species from New Zealand, together with nomenclatural refinements in Australasian *Heteroscyphus* and *Leptoscyphus*. Journal of the Hattori Botanical Laboratory 74: 29-33, f. 1-2.

JOHN J. FLYNN

Curator, Fossil Mammals and Chair, Department of Geology, Field Museum; Lecturer, Committee on Evolutionary Biology and Biological Sciences Collegiate Division, University of Chicago

B.A., Geology and Geophysics, Yale University, 1977.

M.A., Geological Sciences, Columbia University, 1979.

Ph.D., Geological Sciences, Columbia University, 1983.

Alfred Sherwood Romer Prize (4th Annual), Society of Vertebrate Paleontology, 1982.

Secretary, Society of Vertebrate Paleontology, 1993—present.

Associate Editor, Journal of Vertebrate Paleontology, 1989-1992

Leader of numerous field expeditions supported by the NSF, NASA, National Geographic Society, etc.

Research Associate, American Museum of Natural History.

Mammalian systematics and evolution/geochronology and plate tectonics/biogeography.

Research emphasizes a multidisciplinary approach to geologic and biologic problem solving, incorporating my interests in two different, but related geologic specialties: mammalian paleontology and paleomagnetism. Recent field expeditions and laboratory projects integrating biostratigraphy, paleomagnetic stratigraphy, and radioisotopic dating have included: i) refinement of the Cenozoic geologic time scale; ii) constraining the faunal evolution and plate tectonic movements of the Baja Peninsula, Mexico, during the last 80 million years; iii) new discoveries of fossil mammal faunas in South America, providing a better understanding of South American mammal faunal evolution and biogeography; and iv) constraining the tectonic and uplift history of the Andean Mountain belts. Recent field studies have ranged throughout the U.S., Mexico, and South America. I have established a Paleomagnetism Laboratory at the Field Museum that is available for student research. Another aspect of my research has focused on investigation of the anatomy and evolutionary relationships of the mammalian order Carnivora, and its extinct relatives. One student project in this area is using the Image Analysis systems to investigate morphometric variation in carnivores, and to elucidate phylogenetic and functional influences on cranial shape. Another new project involves DNA sequencing to analyze the higher-level evolutionary relationships of Carnivora.

I am interested in students with research interests in: i) integration of paleontologic and geologic techniques, particularly those emphasizing patterns of paleobiologic change through geologic time; or ii) any aspect of mammalian phylogeny or patterns of mammalian faunal change through time and space. Field Museum has excellent Recent and fossil mammal collections, geologic research laboratories, a biochemical laboratory (for DNA sequencing), and morphometries/image analysis laboratories for use by students.

* * *

1984. (with B. J. MacFadden and M. C. McKenna) Land-Mammal Ages, faunal heterochrony, and temporal resolution in Cenozoic terrestrial sequences. Journal of Geology 92: 687-705.

1985. (with W. A. Berggren, D. V. Kent and J. A. Van Couvering) Cenozoic geochronology. Geological Society of the America Bulletin 96: 407-1418.

1986. Correlation and geochronology of middle Eocene strata from the western United States. Palaeogeography Palaeoecology 55: 335-406.

1989. (with R. M. Cipelletti and M. J. Novacek) Paleontology and Geochronology of Early Eocene Marine and Continental Strata, Baja California, Mexico. Geological Society of the America Bulletin 101: 1182-1196.

1993. (with A. R. Wyss) A phylogenetic analysis and definition of the Carnivora, pp. 32-52 In: F. Szalay, M. Novacek, M. McKenna (eds.), Mammal Phylogeny: Placentals, Springer-Verlag, .

1993. (with A. R. Wyss, M. A. Norell, C. C. Swisher III, R. Charrier, M. J. Novacek, and M. C. McKenna) "South America's earliest rodent and recognition of a new interval of mammalian evolution." Nature 365: 434-437.

JACK FOODEN

Research Associate, Mammals, Department of Zoology, Field Museum; Emeritus Professor of Zoology, Department of Biological Sciences, Chicago State University

M.A., Sociology, University of Chicago, 1951.

M.Ed., Science Education, Chicago Teachers College, 1956.

Ph.D., Zoology, University of Chicago, 1960.

Consulting Editor, *American Journal of Primatology*.

Editorial Board, *International Journal of Primatology*.

Primate systematics, particularly Asian catarrhines

My major research effort has been devoted to systematic review of the genus *Macaca*, a widely distributed group of Old World monkeys. Subjects investigated include geographic variation of external, cranial, and molecular characters; natural history; and paleontology. Field work has been conducted in collaboration with local zoologists in China, India, Indonesia, and Thailand. To date, fourteen of the nineteen recognized species of macaques have been monographed.

* * *

1985. (with Quan Guoqiang, Wang Zongren, and Wang Yingxiang) The stumptail macaques of China. *American Journal of Primatology* 8: 11-30.

1986. Taxonomy and evolution of the *sinica* group of macaques: 5. Overview of natural history. *Fieldiana: Zoology*, n.s. 29: 1-22.

1987. (with Quan Guoqiang and Luo Yining) Gibbon distribution in China. *Acta Theriologica Sinica* 7: 161-167.

1988. Taxonomy and evolution of the *sinica* group of macaques: 6. Interspecific comparisons and synthesis. *Fieldiana: Zoology*, n.s. 45: 1-44.

1989. (with S. Lanyon) Blood-protein allele frequencies and phylogenetic relationships in *Macaca*: a review. *American Journal of Primatology* 17: 209-241.

1990. The bear macaque, *Macaca arctoides*: a systematic review. *Journal of Human Evolution* 19: 607-686.

1991. Systematic review of Philippine macaques (Primates, Cercopithecidae: *Macaca fascicularis* subspp.). *Fieldiana: Zoology*, n.s. 64: 1-44.

1993. (with G. H. Albrecht) Latitudinal and insular variation of skull size in crab-eating macaques (Primates, Cercopithecidae: *Macaca fascicularis*). *American Journal of Physical Anthropology* 92: 521-538.

ROBIN B. FOSTER

Research Associate, Department of Botany, Field Museum; Senior Ecologist, Conservation International; Biologist, Smithsonian Tropical Research Institute

A.B., Biology, Dartmouth College, 1966.

Ph.D., Botany, Duke University, 1974.

Assistant Professor of Biology, University of Chicago, 1972-1980.

Senior Ecologist, Conservation International, Washington D.C. 1987-present.

Biologist, Smithsonian Tropical Research Institute, Balboa, Panama, 1988-present.

Scientific Board, International Center for Tropical Ecology, 1991-present.

Ecology of tropical forests; Phenology of flowering and fruiting in tropical forests; Animal dispersal of plant propagules in tropical forests; Local demography and population dynamics in a semi-deciduous tropical forest; Long-term vegetational change along the Rio Manu floodplain, Peru.

Research has focused primarily on tropical lowland rainforests. Studies of flowering and fruiting seasonality have been correlated with animal foraging patterns and fruit dispersal. A program of precise small-scale mapping and identification of trees and saplings in a tropical semi-deciduous forest in Panama has been the basis for studies on plant demography and population change over time.

Ongoing research at Manu National Park in Peru has permitted a variety of research programs to be carried forward over more than a decade. The shifting river has created a continually changing landscape and allowed us to follow the pattern of vegetational succession, and to estimate patterns of forest maturation and decline over hundreds of years.

1980. Heterogeneity and disturbance in tropical vegetation. Pp. 75-92, In: M. E. Soule & B. A. Wilcox (eds.), Conservation Biology: An Evolutionary-Ecological Perspective. Sinauer Press.

1982. Structure and history of the vegetation of Barro Colorado Island. Pp. 67-81, In: E.G. Leigh, A. S. Rand & D. M. Windsor (eds.), The Ecology of a Tropical Forest. Smithsonian Press.

1983. (with S. P. Hubbell) Diversity of canopy trees in a neotropical forest and implications for conservation. Pp. 25-41 In: S. L. Sutton, T. C. Whitmore, and A. C. Chadwick (eds.), Tropical Rain Forest: Ecology and Management.

1985. Plant seasonality in the forests of Panama. Pp. 255-262, In: W. G. D'Arcy & M. D. Correa (eds.), The Botany and Natural History of Panama. Missouri Botanical Garden.

1986. Commonness and rarity in a neotropical forest: implications for tropical tree conservation. Pp. 205-231, In: M. Soule (ed.) Conservation Biology: Science of Scarcity and Diversity. Sinauer Press.

1990. (with S. P. Hubbell) Floristic composition of the Barro Colorado forest. Pp. 85-98, In: A. H. Gentry (ed.) Four Neotropical Forests. Yale University Press.

1990. Long-term change in forest communities of the Rio Manu floodplain. Pp. 565-572, In: A. H. Gentry (ed.) Four Neotropical Forests. Yale University Press, .

1992. (with S. P. Hubbell) Short-term dynamics of a neotropical forest; why ecological research matters to tropical conservation and management. Oikos 63: 48-61.

STEVEN M. GOODMAN

Field Biologist, Mammals, Department of Zoology, Field Museum; Visiting Professor, Université d'Antananarivo, Madagascar

B.S., Biology, University of Michigan, 1977.

Conservation Biology/Tropical Biology/Avian and Mammalian Community Ecology/Taphonomy/Ethnobotany/Egyptology

The fauna of Madagascar and the Eastern Arc Mountains in Tanzania have extraordinarily high numbers of endemic species, many of which are threatened with extinction, primarily as a result of human-mediated habitat destruction and disturbance. One aspect of constructing detailed conservation plans for these biota are faunal surveys that document the current flora and fauna in various threatened sites.

Although it is well documented that a wave of extinction affected large-bodied animals about the time that humans colonized the Madagascar, the knowledge of the island's fauna in the recent past is woefully incomplete. To assess the influence of human activity on the fauna in the recent past, another research program is an investigation of sub-fossil vertebrate deposits. Training of, and collaboration with Malagasy students is a major component of these programs.

Research on the ethnobotany of cultures in North Africa and south-west Asia has been conducted in recent years. Important questions in understanding the evolution of plant resource utilization are whether or not these cultures use the same basic floristic components in similar manners, and if so, whether this is because of information exchange between these cultures, parallel experimentation, or based on chance. Documentation of the uses of various medicinal plants, before many of these practices disappear, is crucial to answering these questions.

* * *

1986. (with P. F. Houlihan). The birds of Ancient Egyptian Art and Hieroglyphs. Warminster: Aris and Phillips

1986. Identification of mammalian prey remains in owl pellets from the central Egyptian Red Sea Mountains. Mammalia 50: 401-403.

1988. (with C. Glynn). Comparative rates of natural osteological disorders in a collection of Paraguayan birds. Journal of Zoology 214: 167-177.

1988. (with J. J. Hobbs). The ethnobotany of the Egyptian Eastern Desert: A comparison of common plant usage between two culturally distinct Bedouin groups. The Journal of Ethnopharmacology 23: 73-89.

1989. The Birds of Egypt. (co-edited with Peter L. Meininger). Oxford: Oxford University Press.

1990. (with P. C. Gonzales). The birds of Mt. Isarog National Park, Southern Luzon, Philippines, with particular reference to altitudinal distribution. Fieldiana, Zoology, n. s. 60.

1991. (with T. S. Schulenberg). The rediscovery of the Red-tailed Newtonia *Newtonia fanovanae* in south-eastern Madagascar with notes on the natural history of the genus *Newtonia*. Bird Conservation International 1: 133-44.

1991. The breeding of the Great Crested Grebe (*Podiceps cristata*) in southern Balochistan. Sandgrouse 13: 54-55.

1992. (with A. Ghafoor). The ethnobotany of Southern Balochistan, with particular reference to medicinal plants. Fieldiana, Botany n.s. 31.

1993. (with F. Ravoavy). Identification of bird subfossils from cave deposits at Anjohibe, Madagascar, with a description of a new giant Coua (Cuculidae: Couinae). Proceedings of the Biological Society of Washington 106: :24-33.

1993. A reconnaissance of Isle Sainte Marie, Madagascar: the status of the forest, avifauna, lemurs and fruit bats. Biological Conservation 65: :205-212.

LANCE GRANDE

Curator, Fossil Fishes, Department of Geology, Field Museum; Lecturer, Committee on Evolutionary Biology and Biological Sciences Collegiate Division, University of Chicago; Adjunct Professor of Biology, University of Massachusetts; Adjunct Professor of Biology, University of Illinois-Chicago

B.S., Geology, University of Minnesota, 1976.

M.S., Geology and Zoology, University of Minnesota, 1979.

Ph.D., Evolutionary Biology, City University of New York/American Museum, 1983.

Research Associate, American Museum of Natural History.

Editorial Board, Revista.

Associate Editor, Journal of Vertebrate Paleontology, 1986-1988.

Phylogenetic interrelationships/historical biogeography of fossil and living actinopterygian fishes. The relationship between the evolution of organisms, and the evolution of the surface of the Earth.

In the most general sense, my research program uses studies of comparative osteology and ontogeny in fossil and living fishes to investigate questions about evolution and historical biogeography. My approach is an interdisciplinary one. I am interested in both fossil and living fishes, so I selected taxonomic groups for study that have extant species together with well preserved fossil species. Groups of particular interest to me are Siluriformes (catfishes), Acipenseriformes (sturgeons and paddlefishes), Clupeomorpha (herring and herring-like fishes), Osteoglossomorpha (bony-tongues) and several other lower teleostean groups.

I am also pursuing studies on ontogeny in the fossil record and late ontogeny in extant species. The different types of intraspecific morphological variation (i.e. ontogenetic vs. non-ontogenetic) and its effect on phylogenetic reconstruction is also part of my recent research program, as is the use of paleontology in systematics and historical biogeography.

I would be particularly pleased to supervise students interested in doing phylogenetic work on some groups of fossil and living fishes. In particular, I would like to support thesis projects involving detailed osteological analyses that include studies of ontogeny, historical biogeography and/or related topics of general significance. Field Museum has the best fossil fish collection in North America and an excellent collection of Recent fishes.

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1985. The use of paleontology in systematics and biogeography, and a time control refinement for historical biogeography. Paleobiology 11(2): 1-11.

1985. (with G. Nelson). Interrelationships of fossil and Recent anchovies (Teleostei: Engrauloidea) and a description of a new species from the Miocene of Cyprus. American Museum Novitates 2826: 1-16.

1986. (with J.T. Eastman). A review of the Antarctic ichthyofaunas, in light of new fossil discoveries. Palaeontology 29(1):113-137.

1991. (with W. Bemis). Osteology and phylogenetic relationships of fossil and Recent paddlefishes (Polyodontidae) with comments on the interrelationships of Acipenseriformes. Society of Vertebrate Paleontology Memoir 1 (supplement to Vol. II, no. 1, Journal of Vertebrate Paleontology 1—121).

1992. (with W. Bemis) Early development of the actinopterygian head. General observations and comments on staging of the paddlefish *Polyodon spathula*. Journal of Morphology 213: 47-83.

1994 (with O. Reippel) Interpreting the Hierarchy of Nature: From Systematic Patterns to Evolutionary Process Theories. Academic Press, 300 pp.

LAWRENCE R. HEANEY

Associate Curator and Head, Mammals, Department of Zoology, Field Museum; Lecturer, Committee on Evolutionary Biology, University of Chicago

B.S., Biology, University of Minnesota, 1971.

M.A., Systematics and Ecology, University of Kansas, 1975.

Ph.D., Systematics and Ecology, University of Kansas, 1979.

Research Fellow, Smithsonian Institution, 1986-1988.

Research Associate, Smithsonian Institution, 1988-present.

Research Associate, American Museum of Natural History, 1991-present.

Honorary Curator, Department of Zoology, Philippine National Museum, 1990-present.

Science Advisor, Center for Tropical Conservation Studies, Silliman University, Philippines, 1992-present.

Mammalian evolution and ecology/evolutionary biogeography/origin and maintenance of patterns of biological diversity/conservation biology/tropical biology.

In spite of the long-term interest of biologists in the dynamics of the processes that influence patterns of biological diversity, a comprehensive understanding has yet to emerge. My current research program focuses on the ecology and evolution of mammals on the islands of Southeast Asia, especially the Philippines, as a natural laboratory where the influence of area, habitat diversity, degree of isolation, and geological histories may be investigated. Variation in these factors allows direct investigation of patterns of extinction, colonization, and speciation in a remarkably diverse fauna. Studies include analysis of morphological, genetic, and ecological diversification, evolution of life history traits, reproductive ecology, and plant-animal interactions. Rapid destruction of natural habitats and extinction of native species has led me to integrate formal ecological and evolutionary studies with research and consulting activities on the impact of deforestation. I am increasingly active in providing advanced training in conservation biology to scientists from the tropics.

Much of my work includes participation by graduate students from both within and outside of the United States. Past students have studied reproductive ecology of bats, seed dispersal systems, tree squirrel population biology, mammalian paleoecology, evolution and functional morphology of horned mammals, population genetics of mammals in island ecosystems, and population biology of tropical birds.

* * *

1978. Island area and body size of insular mammals: evidence from the tri-colored squirrel (*Callosciurus prevostii*) of Southeast Asia. *Evolution* 32: 29-44.

1984. Mammalian species richness on islands on the Sunda Shelf, Southeast Asia. *Oecologia* 61:11-17.

1984. Climatic influences on life history tactics and behavior of North American tree squirrels. pp. 43-78. In: *The Biology of Ground Dwelling Squirrels*, J.O. Murie and J.R. Michener (eds.). University of Nebraska Press. 459 pp.

1986. L.R. Heaney and B. D. Patterson, eds. *Island Biogeography of Mammals*. Academic Press, London. 271 pp. (initially produced as a special issue of the *Biological Journal of the Linnean Society*).

1989. (with P. D. Heideman, E. A. Rickart, R. B. Utzurrum, and J. S. H. Klompen) Elevational zonation of mammals in the central Philippines. *Journal of Tropical Ecology* 5: 259-280.

1993. (with A. T. Peterson) Genetic differentiation in Philippine bats of the genera *Cynopterus* and *Haplonycteris*. *Biological Journal of the Linnean Society* 49: 203-218.

1994. Biodiversity and the conservation of mammals in the Philippines. *Asia Life Sciences* in press.

PATRICK S. HERENDEEN

Curatorial Coordinator, Fossil Plants, Department of Geology, Field Museum

B.S. California State University, Long Beach. 1982.

M.S. Michigan State University, East Lansing, Michigan, 1985.

Ph.D. Indiana University, Bloomington, Indiana, 1990.

Visiting Professor, Indiana University, Department of Biology, June-August, 1990.

Research Associate, Field Museum of Natural History, Chicago, Il. July 1990- present.

Postdoctoral Research Fellow, Swedish Museum of Natural History. August 1990-1991.

Postdoctoral Research Associate, Bailey Hortorium, Cornell University. Sept. 1991- March 1993.

Systematics and paleobotany of flowering plants.

My studies address the evolutionary history of plants and in particular the history of large complex groups such as the legumes and laurels, as well as the angiosperms as a whole. My work has focused on understanding systematic and biogeographic relationships within families, and on structural evolution in early angiosperms. Recent work has been directed at two research projects: paleobotany and systematics of the legume family, and the Cretaceous fossil record of flowering plants (angiosperms). My current major legume project is a combined paleobotanical and neobotanical study of the diverse tropical subfamily Caesalpinioideae. This group has a fairly rich fossil record and it will be important to incorporate as many extinct taxa as possible in the cladistic analyses. One such example is *Podocarpium* ("Podogonium"), an extinct genus that was widespread in the Miocene of Europe. I have also been pursuing a study of structural evolution in the wood of early angiosperms. This project is assessing patterns of evolution in the secondary xylem of angiosperms from the Lower and mid-Cretaceous. Data from this study are facilitating an evaluation of a number of traditional hypotheses of evolutionary patterns in angiosperm wood, particularly evolution of vessel and ray structure.

* * *

1992. (with D. L. Dilcher) (eds.). Advances in Legume Systematics, part 4. The Fossil Record. Royal Botanic Gardens, Kew.

1992. The fossil history of the Leguminosae from the Eocene of southeastern North America. Pp. 85-160 In P. S. Herendeen and D. L. Dilcher, (eds). Advances in Legume Systematics, Part 4. The Fossil Record. Royal Botanic Gardens, Kew.

1992. (with W. L. Crepet, and D. L. Dilcher) The fossil history of the Leguminosae: phylogenetic and biogeographic implications. Pp. 303-316. In P. S. Herendeen and D. L. Dilcher, (eds). Advances in Legume Systematics, Part 4. The Fossil Record. Royal Botanic Gardens, Kew.

1992. (with D. L. Dilcher and F. Hueber) Fossil *Acacia* flowers with attached anther glands from Dominican Republic amber. Pp. 33-42. In P. S. Herendeen and D. L. Dilcher, (eds). Advances in Legume Systematics, part 4. The Fossil Record. Royal Botanic Gardens, Kew.

1992. (with W. L. Crepet) Papilionoid flowers from the early Eocene of southeastern North America. Pp. 43-55 In P. S. Herendeen and D. L. Dilcher, (eds). Advances in Legume Systematics, part 4. The Fossil Record. Royal Botanic Gardens, Kew.

1992. *Podocarpium podocarpum* comb. nov., the correct name for *Podogonium knorrii* Heer, nom. illeg. (fossil, Fabaceae). Taxon 41: 731-736.

1993. (with W. L. Crepet and K. C. Nixon) *Chloranthus*-like stamens from the Upper Cretaceous of New Jersey. American Journal of Botany 80: 865-871.

ROBERT F. INGER

MacArthur Curator, Amphibians and Reptiles, Department of Zoology, Field Museum; Lecturer, Committee on Evolutionary Biology, University of Chicago

B.S., University of Chicago, 1942

Ph.D., University of Chicago, 1954.

Editorial Board, Zoological Research (Kunming)

Distinguished Scientist, Field Museum of Natural History.

Honorary Curator of Reptiles, Sarawak Museum.

Community ecology/tropical amphibians and reptiles/systematics of anuran amphibians.

Although much has been written about the organization and structure of tropical communities of vertebrates, almost nothing is known about variation of those communities within a region over time. I am studying variation in the structure of communities of amphibians in Bornean forests over time (one to twenty years) and space. This program involves work both in the field and in the museum laboratory and analysis of species diversity at the local and regional levels, relative abundance of species, movements of individuals, annual patterns of reproduction, and partitioning of spatial resources by adults and larvae.

My systematics research concentrates on phylogenetic relations of several families of anurans that form important components of the fauna of southeast Asia and adjacent islands. One concern of these investigations is the extent of parallel morphological diversification of adults and larvae. Another concern is the relation between morphogenetic constraints and ecological distribution in larvae.

I am interested in advising students working in community ecology in tropical forests or developmental morphology of anuran larvae.

* * *

1986. (with H. K. Voris & K. J. Frogner) Organization of a community of tadpoles in rain forest streams in Borneo. Journal of Tropical Ecology 2: 193-205.

1989. (with E. Nodzenski & R. J. Wassersug) Developmental differences in visceral morphology in megophryine pelobatid tadpoles in relation to their body form and mode of life. Biological Journal of the Linnean Society 38: 369-388.

1991. Uncoupling of related structural changes in metamorphosing torrent-dwelling tadpoles. Copeia 1990: 1047-1054.

1992. Variation in apomorphic characters in the stream-dwelling tadpoles of the bufonid genus *Ansonia*. Zoological Journal of the Linnean Society 105: 225-237.

1992. (with R. B. Stuebing) The montane amphibian fauna of northwestern Borneo. Malayan Nature Journal 46: 41-51.

1993. (with H. K. Voris) A comparison of amphibian communities through time and from place to place in Bornean forests. Journal Tropical Ecology 9:409-433.

JULIAN C. KERBIS PETERHANS

Research Associate, Mammals, Department of Zoology, Field Museum; Adjunct Faculty, Department of Anthropology, University of Chicago.

B.Sc. Biology, Beloit College, Beloit, Wisconsin, 1974.

M.A. Anthropology, University of Chicago, 1979.

Ph.D. Anthropology, University of Chicago, 1990.

Consultant, United States Fish and Wildlife Service, National Forensics Laboratory.

Post-doctoral Curatorial Associate, African mammals, Field Museum, 1990-1993.

Collection Manager, Division of Mammals, Field Museum, 1987-1989.

Lecturer, Loyola University of Chicago, Department of Anthropology 1983-1984.

Lecturer, Beloit College, Archeological Field School.

Biogeography and systematics of African mammals, behavioral ecology of the Carnivora, evolution of the Hominoidea, faunal analysis, taphonomy.

Research programs have been directed in two directions, one zoogeographic, the other taphonomic. For the past 4 years, small mammal surveys in the mountains astride the Albertine Rift have shown that these mountains house 1) independent small mammal faunas but with numerous elements in common 2) Africa's richest sorcid community, indicating that this area has been fundamental in the origin, diversification and maintenance of African shrews and 3) Africa's richest endemic small mammal community, speaking to the long term isolation and stability of the region. Comprehensive surveys of small mammals from these isolated mountain tops are continuing in order to a) assess the biogeographic history of the different mountain tops by comparing faunal communities within and among adjacent lowland and montane communities and more distant montane regions and b) develop phylogenetic hypotheses for groups which are well represented in both montane and lowland regions (e.g., Soricidae and Murinae).

Taphonomic projects include wide-ranging inquiries into patterns of predation, specifically among felids and primates, carnivores and ungulates, eagles and primates, and owls and rodents. Data gathered includes analyses of sex and age, species composition, and body part selection and destruction. These analyses are fundamental in establishing predator-specific 'fingerprints' and in deducing sociobiological attributes of prey and predator behavior.

* * *

1992. (with L. K. Horwitz) A bone assemblage from a striped hyena (*Hyena hyena*) den in the Negev. Israel Journal of Zoology 37(4): 225-246.

(1993. (with R.W. Wrangham, M. L. Carter and M. D. Hauser). A contribution to tropical rain forest taphonomy: retrieval and documentation of chimpanzee remains from Kibale Forest, Uganda. Journal of Human Evolution 25: 485-514.

(in press) (with Fay, J. M., R. Carroll, R., and D. Harris). Leopard-Gorilla Interactions in Central African Republic. Journal of Human Evolution.

(in press). Bone Gathering Activities of Hyenas, Leopards and Porcupines: Implications for Paleoanthropology. University of Chicago Press.

(in review) (with B. D. Patterson). A reappraisal of the semi-aquatic mouse, *Nilopegamys* (Osgood) and its evolutionary implications. Zoological Journal of the Linnean Society, London.

JOHN KETHLEY

Associate Curator, Insects, Department of Zoology, Field Museum; Lecturer, Committee on Evolutionary Biology, University of Chicago; Lecturer, Department of Entomology, Ohio State University.

B.S., Botany, University of Georgia, 1964.

Ph.D., Entomology, University of Georgia, 1969.

NIH Post-doctoral Trainee, The Acarology Laboratory, Ohio State University.

Systematics/phylogeny/comparative developmental morphology/zoogeography and cytology of acariform mites.

Research interests lie in two areas: 1) chelicerae terrestrialization and the evolution of mites; 2) the evolution of meiosis.

Chelicerates, including mites, were among the first arthropods to have colonized land (Devonian or earlier). The contemporary distribution of early lineages appears to reflect their ancestral coastal, fluvial or alluvial habitats. Research is focused on documentation of the global species diversity, community structure, zoogeography and phylogenetic relationships of these microarthropods. Parallel research seeks to integrate paleogeographic, paleoclimatic and tectonic data to clarify contemporary distributions and identify regions that may have been involved in significant extinction events.

Standard paradigms of evolutionary genetics preclude the accumulation of significant biological diversity within wholly thelytokous lineages. Collaborative research with Roy Norton, S.U.N.Y., Syracuse, has documented the existence of a very large monophyletic lineage of entirely thelytokous oribatid mites that he hypothesized to have given rise to an even larger lineage of bisexual mites, the astimata. Parallel collaborative research with Dana Wrensch, Ohio State University, reassessed cytological mechanism of the thelytokous arthropods. Our reinterpretation of the little known pattern of inverted meiosis, where sister chromatids separate in anaphase I, formed the basis of a mechanism that would permit long term success and diversification of thelytokous mites. Our survey of eukaryote cytology indicated widespread occurrence of inverted meiosis in most groups (excluding deuterostomes) suggesting that inverted meiosis was ancestral and had independently given rise to "normal meiosis" numerous times. We are pursuing molecular and cytological ramifications of this hypothesis.

I would be pleased to work with graduate students interested in either the evolution of chelicerae terrestrialization or meiotic patterns.

* * *

1982. Acariformes: Prostigmata Pp. 117- 145. In: S. P. Parker (ed) Synopsis and Classification of Living Organisms Vol. 2. McGraw-Hill.

1989. (with R. A. Norton, P. M. Bonamo and W. A. Shear) A terrestrial alicorhagiid mite (Acari: Acariformes) from the Devonian of New York. Micropaleontology 35(4): 367-373.

1990. Acarina: Prostigmata (Actinedida). Pp. 667-756 In: D. Dindal (ed). Soil Biology Guide. John Wiley & Sons, New York.

1993. (with R. A. Norton, D. E. Johnston and B. M. O'Connor) Phylogenetic Perspectives on Genetic Systems and Reproductive Modes of Mites. Pp. 8-99 In: D. L. Wrensch and M. Ebbert (Eds.) Evolution and Diversity of Sex Ratio in Insects and Mites Chapman & Hall, New York.

1994. (with D. L. Wrensch and R. A. Norton) Cytogenetics of Holokinetic chromosomes and Inverted Meiosis: Keys to the Evolutionary success of Mites, with Generalizations of Eukaryotes. Pp. 282-343. In: M. Houck (Ed.), Mites: Ecological and Evolutionary Analyses of Life-History Patterns, Chapman & Hall, New York

THOMAS G. LAMMERS

Assistant Curator, Vascular Plants, Department of Botany, Field Museum

B.S., Botany, Iowa State University, 1977.

M.A., Biology, University of Northern Iowa, 1981.

Ph.D., Botany, The Ohio State University, 1988.

Standing Committee for Botany, Pacific Science Association.

Education Committee, Botanical Society of America.

Numerous field research expeditions funded by Sigma XI, NSF, William Sherman Turrell Herbarium Fund, National Geographic Society.

Visiting Assistant Professor, Miami University, 1988-1990.

Taught at University of Illinois at Chicago in 1992 and 1993 (plant taxonomy).

Classification and evolution of the Campanulaceae, especially subfamily Lobelioideae.

My research interests are the evolution and classification of flowering plants. Current focus is the family Campanulaceae, in particular subfamily Lobelioideae. Specific goals are to understand the patterns of evolutionary diversification in the group; to identify the biological processes responsible for those patterns; and to provide a sound and useful classification of the group on this basis. In meeting these goals, I embrace the concept that the best results are obtained through the rigorous and objective synthesis of diverse kinds of data. Work at present involves several poorly understood clades in the Hawaiian Islands, Chile, and the Caribbean; patterns of chromosomal evolution in the group as a whole; and an assessment of the family's diversity in Peru.

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1990. (with D. J. Crawford, T. F. Stuessy, M. Silva, and P. Pacheco) Allozyme variation and evolutionary relationships among three species of *Wahlenbergia* (Campanulaceae) in the Juan Fernandez islands. Botanical Gazette 151: 119-124.

1990. Sequential paedomorphosis among the endemic Hawaiian Lobelioideae (Campanulaceae). Taxon 39: 206-211.

1991. Systematics of *Clermontia* (Campanulaceae: Lobelioideae). Systematic Botany Monographs 32: 1-94.

1992. (with N. Hensold) Chromosome numbers of Campanulaceae. II. The *Lobelia tupa* complex of Chile. American Journal of Botany 79: 585-588.

1992. Circumscription and phylogeny of the Campanulales. Annals of the Missouri Botanical Garden 79: 388-413.

1992. Systematics and biogeography of the Campanulaceae of Taiwan. Pp. 43-61 in: C.-I. Peng (ed.) Phytogeography and Botanical Inventory of Taiwan. Academia Sinica, Taipei.

1993. (with A. K. Pandey and A. Jha) Sporogenesis and gametogenesis in Pacific island *Lobelia* (Campanulaceae-Lobelioideae). Phytomorphology 42: 63-69.

1993. A new species of *Siphocampylus* (Campanulaceae: Lobelioideae) from northern Peru. Brittonia 45: 28-31.

1993. Chromosome numbers of Campanulaceae. III. Review and integration of data for subfamily Lobelioideae. American Journal of Botany 80: 660-675.

1993. (with D. L. Kama and N. R. Morin) Campanulaceae. Pp. 310-326 in: L. Brako and J. L. Zarucchi, Catalogue of the Flowering Plants and Gymnosperms of Peru. Missouri Botanical Garden, St. Louis.

1993. *Lobelia bridgesii*, Campanulaceae. Kew Magazine 10: 70-75, p. 220.

SCOTT LANYON

Pritzker Curator of Systematic Biology, and Head, Birds, Department of Zoology, and Deputy Vice President, Academic Affairs, Field Museum; Lecturer, Committee on Evolutionary Biology, University of Chicago; Adjunct Professor, Department of Biological Sciences, University of Illinois at Chicago; Adjunct Professor, Department of Biology, Illinois State University

B.A., Biology, S.U.N.Y. College at Geneseo, 1977.

M.A., Ecology, Indiana University, 1980.

Ph.D., Evolutionary Biology, Louisiana State University, 1985.

Fellow, American Ornithological Society.

Expedition Leader for trips to Panama, Peru, Brazil, Bolivia, Marshall Islands, Puerto Rico, & Jamaica.

Avian evolutionary biology/biochemical systematics/systematic philosophy and methodology/evolution of avian social systems.

I am continuing to concentrate my research efforts on the elucidation of phylogenetic relationships within the New World Blackbirds (Icterinae). Within this assemblage of some 97 species it is possible to find examples of virtually every behavior/morphological pattern known to occur within song birds: monogamy, polygyny, promiscuity, delayed maturation, sexual size dimorphism, sexual dichromatism, brood parasitism, vocal mimicry, territoriality, coloniality, extensive geographic variation, etc. As interesting and as well studied as this group is, no phylogeny depicting the genealogical relationships between the component species and genera has yet been proposed. I have completed my first attempt at reconstruction of the phylogeny of this assemblage, using DNA sequence characters. I now plan to refine this estimate of evolutionary history with additional DNA sequence information and with a survey of additional species.

A second aspect of my research program concerns the philosophy and methodology of phylogeny reconstruction. I recently published computer algorithms for summarizing results from studies of independent sets of systematic characters.

The primary collection project under my supervision is the verification of the computer database for the bird collections. In addition, I am coordinating the construction of a computer database which will record the availability of skeletal and fluid-preserved specimens of birds in the museums of the world.

* * *

1992. Interspecific brood parasitism in blackbirds (Icterinae): A phylogenetic perspective. Science 225: 77-79.

1992. Of birds and their molecules: A review of Sibley and Ahlquist. Condor 94: 304-310.

1992. (with A. T. Peterson) New bird species, DNA studies, and type specimens: A commentary. Trends in Ecology and Evolution 7: 167-168.

1992. (with J. Engel, J. Flynn and P. R. Crane) Women in Science. Nature 360: 405

1993. (with R.C. Banks, S. M. Goodman and T. S. Schulenberg) Type specimens and Principles of Avian Taxonomy. Auk 110: 413-414.

1993. Phylogenetic frameworks: Towards a firmer foundation for the comparative approach. Biological Journal Linnean Society 49: 45-61.

SCOTT LIDGARD

Associate Curator, Fossil Invertebrates, Department of Geology, Field Museum; Lecturer, Committee on Evolutionary Biology, University of Chicago

B.S., University of California at Santa Cruz, Earth & Planetary Sciences, 1976.

M.S., Paleobiology, University of Rochester, Geological Sciences, 1979.

Ph.D., Paleobiology, The Johns Hopkins University, Earth & Planetary Sciences, 1984.

Predoctoral Fellow, Paleobiology, Smithsonian Institution, 1982.

NATO Postdoctoral Fellow, British Museum of Natural History, 1984.

Chair, Association of North America Paleontological Societies

Evolution and ecology of cheilostome bryozoans, particularly the relationships of colonial growth and form/evolutionary paleoecology and the resolution of large-scale patterns in the fossil record/angiosperm diversification and Cretaceous floristic trends.

Research focuses on the roles of different modes of growth in large scale patterns of cheilostome bryozoan evolution, environmental distribution, and ecology. My previous work on comparative skeletal ontogenies of zooids within colonies recognized characteristic zooid budding patterns of encrusting cheilostomes. More recently I have synthesized the overriding evolutionary trends in predominant modes of growth in this group, documenting a persistent evolutionary transition in which one mode of growth is supplanted by another during the past 100 million years. In an environmental context, this work has also provided a novel test of paleoenvironmental studies of other groups of marine benthos in which onshore origin was followed by expansion into offshore, deeper water marine environments.

A related research problem involves re-evaluating the role of competition in large scale evolutionary replacements such as dinosaurs versus mammals or brachiopods versus clams. This work on cheilostome and cyclostome bryozoans has produced surprising results—the pattern of replacement differs when species, genera, or families are used as the basis for the analysis.

Collaborative research (with P. R. Crane) examines large-scale floristic patterns during the radiation of angiosperms. We have employed trend surface analyses to demonstrate a striking latitudinal shift (from tropical to boreal) in the pattern of increasing angiosperm dominance through the Cretaceous. This work is part of more comprehensive synthesis of paleolatitudinal and temporal trends in the apparent diversity of all Cretaceous land plants. Recently, we have also attempted to clarify the rate and magnitude of angiosperm radiation using the parallel fossil records of leaves and pollen/spores, to provide a deductive test of evolutionary tempo during the diversification of a major group of organisms.

* * *

1986. Ontogeny in animal colonies: a persistent trend in the bryozoan fossil record. *Science* 232: 230-232.

1988. (with P. R. Crane) Quantitative analyses of the early angiosperm radiation. *Nature* 331: 344-346.

1989. (with P. R. Crane) Angiosperm diversification and paleolatitudinal gradients in Cretaceous floristic diversity. *Science* 246: 675-678.

1989. (with J. B. C. Jackson) Growth in encrusting cheilostome bryozoans: I. Evolutionary trends. *Paleobiology* 15: 255-282.

1990. (with P. R. Crane) Angiosperm diversification and Cretaceous floristic trends: a comparison of palynofloras and leaf macrofloras. *Paleobiology* 16: 77-93.

1993. (with F. K. McKinney and P. D. Taylor) Competition, clade replacement, and a history of cyclostome and cheilostome bryozoan diversity. *Paleobiology* 19: 352-371.

PETER E. LOWTHER

Research Associate, Birds, Department of Zoology, Field Museum

B.S., Zoology, Iowa State University, 1970

M.A., Systematics and Ecology, University of Kansas, 1976

Ph.D., Systematics and Ecology, University of Kansas, 1979

Elective Member, American Ornithologists' Union.

Editor for North American Bird Bander, Inland Bird Banding Association.

Brood parasitism, population biology of passerine birds

Research interests are concerned with breeding biology at a population or community level and investigations to help understand brood parasitism. Active projects include monitoring breeding biology of a suburban nesting colony of House Sparrows; study of brood parasitism in birds, specifically Brown-headed Cowbirds, based on field studies and museum collections; and structure of tallgrass prairie bird communities.

* * *

1975. Geographic and ecological variation in the family Icteridae. Wilson Bulletin 87:481-495.

1977. Selection intensity in North American House Sparrows *Passer domesticus*. Evolution 31:649-656.

1983. Breeding biology of House Sparrows: intercolony variation. Occasional Papers, Museum of Natural History, University of Kansas, No. 107:1-17.

1984. Cowbird nest selection. Wilson Bulletin 96:103-107.

1988. Breeding biology of House Sparrows: patterns of intra-clutch variation in egg size. In: J. Pinowski and J. D. Summers-Smith (eds.), Granivorous birds in agricultural landscapes, PWN-Polish Scientific Publishers, Warszawa.

1992. (with C. L. Cink) House Sparrow. In: A Poole, P Stettenheim and F Gill (eds.), The Birds of North America, No. 12 Philadelphia: The Academy of Natural Sciences; Washington, DC: The American Ornithologists' Union.

1993. Brown-headed Cowbird. In: A Poole and F Gill (eds.), The Birds of North America, No. 47 Philadelphia: The Academy of Natural Sciences; Washington, DC: The American Ornithologists' Union.

GARY L. SMITH MERRILL

Research Associate, Bryology, Department of Botany, Field Museum

B.A., Botany, State University of Iowa, Iowa City, 1962.

M.S., Botany, State University of Iowa, Iowa City, 1964.

Ph.D., Botany, Columbia University, New York, 1969.

Research Associate, Biology, Kansas State University, 1988-1992.

Assistant Professor, Botany, Drew University 1977-1979, 1980-1986.

Taxonomist, Jardín Botánico Nacional, Santo Domingo, Dominican Republic, 1979-1980.

Associate Curator (Bryophyta), New York Botanical Garden, 1969-1976.

Leader and participant in expeditions to arctic Alaska, Brazil, Japan.

Systematics and geography of mosses, particularly Polytrichaceae; floristics of Great Plains mosses; New Zealand Hepaticae

Current research projects include preparation of treatments of Polytrichaceae (10 genera, 48 spp) for Volume 13 of Flora of North America (currently work is concentrated on the genus *Atrichum*); an outline of a revised and updated classification of the family; study of collections of Polytrichaceae from central America and elsewhere sent to me for identification; and a monographic study of the Australasian hepatic genus *Telaranea* (with Dr. John Engel). 1993 saw publication of my treatment of Polytrichaceae as part of the Moss Flora of Mexico, as well as several journal articles.

My research has been concerned chiefly with the Polytrichaceae, a family of mosses of world-wide distribution, composed of 22 genera and an estimated 300 species. The family represents an isolated group, with no extant (or known fossil) relatives, and is notable for the structural complexity of both gametophyte and sporophyte generations, and a number of features not found in any other group of bryophytes. They are the only mosses with specialized internal conducting tissues, comparable to those of simple vascular plants.

I have also a continuing interest in the bryoflora of the Great Plains region. An important recent discovery is the new moss genus and species, *Ozobryum ogalalense* Merrill, restricted to NW Kansas and adjacent Nebraska. Bryophytes are capable of persisting as distributional relicts which reflect past climatic conditions and floras, and endemics such as *Ozobryum* may be clues to earlier regional floras of which they are the sole survivors. A more thorough knowledge of the bryophytes of the Great Plains should provide insights into the complex vegetational history of the region.

* * *

1969. On *Atrichopsis*, with notes on some austral *Psilopilum* species (Polytrichaceae). Bulletin of the Torrey Botanical Club 96: 60-69.

1971. Conspectus of the genera of Polytrichaceae. Memoirs of the New York Botanical Garden 21(3): 1-80.

1975, 1976. Polytrichaceae. In: Ohashi, H. The Flora of Eastern Himalaya. University Museum Tokyo Bulletin 8: 244-246. & Addendum to the Polytrichaceae of "Flora of Eastern Himalaya" Journal of the Hattori Botanical Laboratory 41: 419-425.

1991. *Oligotrichum denudatum* (Polytrichaceae), a new moss species from Minas Gerais, Brazil. Novon 1: 107-109.

1992. *Ozobryum ogalalense* (Polytrichaceae), a new moss genus and species from the American Great Plains. Novon 2: 255-258.

1992. Notes on North American Polytrichaceae: *Polytrichastrum* G. Sm. The Bryologist 95: 270-273.

1994. Polytrichaceae. In: Sharp, A. J., H. A. Crum & P. M. Eckel (eds.) The Moss Flora of Mexico. Memoirs of the New York Botanical Garden 69: 1068-1092.

GREGORY M. MUELLER

Associate Curator, Mycology and Head, Cryptogams, Department of Botany, Field Museum

B.A., Southern Illinois University, Carbondale, 1976

M.S., Southern Illinois University, Carbondale, 1979

Ph.D., The University of Tennessee, Knoxville, 1982

Alexopoulos Prize, The Mycological Society of America, 1992.

Graduate Research Award, Mycological Society of America, 1981.

Advisory Panel, Systematic Biology Program, National Science Foundation, 1992-1993.

Councilor for Systematics and Evolution, Mycological Society of America, 1993-1996.

Chair, Editorial Committee, *McIlvainea* and *The Mycophile*.

Scientific Advisor, Illinois Mycological Association.

Visiting Scientist, Institute of Physiological Botany, Uppsala University, Sweden. 1982-1983.

Postdoctoral Fellow, Mountain Lake Biological Station, Pembroke, VA. 1983.

Postdoctoral Research Associate, Dept. of Botany, University of Washington, Seattle, WA. 1984-1985.

Systematics, population biology, biogeography, and ecology of Basidiomycetes

My research program centers on the systematics, ecology, and evolution of higher fungi and the mutualistic symbiosis that some of them form termed mycorrhizae. Two long-term projects are currently receiving most of my attention: i) An intensive survey of mushrooms and related fungi of the Costa Rican tropical oak forests. This study is being supported by a grant from the National Science Foundation and the U.S.-Agency for International Development. In addition to developing the first comprehensive survey of higher fungi from the neotropics, a major goal of this project is to build scientific infrastructure in Costa Rica through training of graduate students and improving facilities. ii) A monographic study of the genera *Hydnangium*, *Laccaria*, and *Podohydangium*. This work is designed to test various theories of speciation, coevolution (with their obligate tree symbionts), and biogeography of fungi that form ectomycorrhizae. Both of these projects entail an active field work component as well as laboratory studies that include micromorphological analyses (computer aided light microscopy, SEM, and TEM), examination of in vitro culture morphology, pairing studies, and DNA sequencing. These interrelated projects are providing information on fungal ecology and biology that are crucial to temperate and tropical forest management and conservation.

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1990. (with Gardes, M., J. A. Fortin, and B. R. Kropp) Restriction fragment length polymorphisms in the nuclear ribosomal DNA of four *Laccaria* spp.: *L. bicolor*, *L. laccata*, *L. proxima*, and *L. amethystina*. *Phytopathology* 80: 1312-1317.

1991. *Laccaria laccata* complex in North America and Sweden: Intercollecion pairing and morphometric analyses. *Mycologia* 83: 578-594.

1992. Systematics of *Laccaria* (Agaricales) in the continental United States and Canada, with discussions on extralimital taxa and descriptions of extant types. *Fieldiana: Botany, n.s.* 30: 1-158.

1992. (with B. A. Strack) Evidence for a mycorrhizal host shift during migration of *Laccaria trichodermophora* and other agarics into neotropical oak forests. *Mycotaxon* 45: 249-256.

1993. (with J. F. Ammirati). Cytological studies in *Laccaria* (Agaricales) II. Assessing phylogenetic relationships among *Laccaria*, *Hydnangium* and other Agaricales. *American Journal of Botany* 80: 322-329.

1993. (with A. von Hofsten, A. Axén, and B. A. Strack). Basidiospore wall ultrastructure of the false-truffle *Hydnangium* and its phylogenetic significance. *Mycologia* 85: 890-893.

ALFRED F. NEWTON, JR.

Associate Curator and Head, Insects, Department of Zoology, Field Museum

A.B., Chemistry, Rutgers University, 1966.

A.M., Chemistry, Harvard University, 1970.

Ph.D., Zoology, Harvard University, 1973.

Research Associate, American Museum of Natural History.

Editorial Board, *Psyche*, 1978-1986.

Australian Biological Resources Study.

Field Research program supported by NSF, American Philosophical Society, Ernst Mayr Grant, National Geographic Society.

Phylogeny, comparative morphology and evolution of beetles; historical biogeography; insect association with specialized microhabitats.

My current research revolves around studies on the evolution of the large beetle family Staphylinidae (over 45,000 named species). A long-term study of the higher-level classification and evolution of the group continues by focusing on reconstructing the phylogeny of one of the family's four main lineages. I have nearly completed a monographic study of the 185+ New World species of the genus *Platydracus*, whose species promise to be of special interest for understanding the origin of current distribution patterns of forest-dwelling insects in Mexico and Central America. Collaboration with M.K. Thayer continues on another long-term project to improve knowledge of the staphylinoid beetle fauna of Australia and other southern temperate areas, with the ultimate aim of using this group to help understand the origin of southern disjunct distribution patterns (Australia+New Zealand+Chile) that are very common within the group.

* * *

1982. (with J.F. Lawrence) Evolution and classification of beetles. *Annual Review of Ecology and Systematics* 13: 261-190.

1984. Mycophagy in Staphylinoidea (Coleoptera). In: *Fungus/Insect Relationships*, Q. Wheeler and M. Blackwell (eds.), pp. 302-353. *Perspectives in Ecology and Evolution*, Columbia University Press, New York.

1988. (with M. K. Thayer) A critique on Naomi's phylogeny and higher classification of Staphylinidae and allies (Coleoptera). *Entomologia Generalis* 14: 63-72.

1989. (with D. S. Chandler) World catalog of the genera of Pselaphidae (Coleoptera) *Fieldiana: Zoology, n.s.* 53: 1-93.

1990. Larvae of the Staphyliniformia (Coleoptera): where do we stand? *Coleopterists Bulletin* 44: 205-210.

1990. Staphylinidae (adults) and Staphylinidae (larvae). In: *Soil Biology Guide*, D.L. Dindal (ed.), pp. 1137-1174. J. Wiley and Sons, New York.

1992. (with M. K. Thayer). Current classification and family-group names in Staphyliniformia (Coleoptera). *Fieldiana: Zoology, n.s.* 67: 1-92.

1993. (with J. S. Ashe) Larvae of *Trichophya* and phylogeny of the tachyporine group of subfamilies (Coleoptera: Staphylinidae) with a review, new species and characterization of Trichophyinae. *Systematic Entomology* 18: 267-286.

MATTHEW H. NITECKI

Curator, Fossil Invertebrates, Department of Geology, Field Museum; Lecturer, Committee on Evolutionary Biology and Biological Sciences Collegiate Division, University of Chicago

M.S., Geology, University of Chicago, 1962

Ph.D., Paleozoology, University of Chicago, 1968

Visiting Investigator, USSR Academy of Sciences, 1978.

Guest Scientist, USSR Academy of Sciences, 1981.

Exchange Scholar, National Academy of Sciences, 1984.

Research Scholar, Fulbright-Hays, 1985-1986.

Editor, Paleontological Journal, Acta Paleontologica.

Visiting Professor, University of Oslo, 1991-1992.

Problematic fossils/history and sociology of science/theoretical evolutionary biology.

Problematic Fossils: Reconstruction of the history of the biosphere is among the main goals of evolutionary biology, and problematic fossil groups play a pivotal role in this, for it is they that require us to reshape our ideas of the history of life. The problematic fossils that Nitecki studies (cyclocrinids and receptaculitids) do not fit into any living phylum, and thus represent the record of early experiments with life.

History and Sociology of Science: Nitecki has conducted a series of studies designed to provide some evidence on when, why, and by whom scientific theories are accepted. He is seeking to determine the underlying structure of scientific attitudes and beliefs, not only about facts and relationships, but also about the nature of science—its practices, processes, and norms. He has begun to devise a methodology for testing why and when scientific theories are rejected.

Theoretical Evolutionary Biology: There is currently more interest in the application of evolutionary accounts and methodologies in the social sciences and humanities than at any time since the days of Darwin. Furthermore, the current interest is more methodological and less "sociopolitical." To some extent, this rebirth of interest has been stimulated by the publication of series of multiauthored books edited by Nitecki. The issues discussed are not only of broad general interest but also of great significance for understanding the nature of historical inquiry and its relation to the general issue of human evolution.

1972. North American Silurian Receptaculitids Algae: Fieldiana: Geology, 28: 1-108.

1979. (with D.F. Toomey) Organic Buildups in the Lower Ordovician of Texas and Oklahoma. Fieldiana: Geology, n.s. 2: 1-181.

1982. (with D.C. Fisher) Standardization of the Anatomical Orientation of Receptaculitids. Paleontological Society Memoir 13:1-40.

1985. (with A. Hoffman) Reception of the asteroid hypothesis of terminal Cretaceous extinctions. Geology, 13 (2): 884-887.

1986. (with A. Hoffman) (eds.) Problematic Fossil Taxa. Oxford University Press.

1988. Evolutionary Progress. (ed.) University of Chicago Press.

1992. (with D.V. Nitecki) (eds.) History and Evolution. SUNY Press.

1993. (with D. V. Nitecki) (eds.) Evolutionary Ethics. SUNY Press.

BRUCE D. PATTERSON

Curator, Mammals, Department of Zoology, Field Museum; Lecturer, Committee on Evolutionary Biology, University of Chicago; Adjunct Professor, Department of Biological Sciences, University of Illinois, Chicago; Adjunct Professor, Department of Biological Sciences, Northern Illinois University; Invited Professor, Museo de Historia Natural, Universidad de San Marcos, Lima, Perú

B.S., St. Lawrence University, Biology, 1974.

M.S., New Mexico State University, Biology, 1978.

Ph.D., New Mexico State University, Biology (Experimental Statistics), 1981.

Editor for Reviews, Journal of Mammalogy.

Editorial Board, Biodiversity Letters.

Editorial Board, Mastozoología Neotropical.

Historical and insular biogeography/systematics of Neotropical mammals/distribution and abundance/niche relationships

My research seeks to understand the spatial and temporal organization of biological diversity, especially factors involved in the diversification and coexistence of living mammals. My field studies amass samples for museum-based research. Laboratory approaches include statistical analysis of distribution and abundance, comparative anatomy, morphometrics, and biochemical surveys (allozymes and PCR analyses).

Studies on insular mammals revealed a non-random structure in the species composition of insular biotas termed nested subsets. This distribution pattern has been found to characterize a striking variety of taxa, including plants, insects, mollusks, reptiles, birds, and mammals on islands and on continents. The implications of this type of structure for conservation, for ecological resource partitioning, and for coevolutionary responses among species are being addressed.

Patterns and processes involved in historical biogeography are also under investigation. My fieldwork has sampled a number of important centers of endemism. Phylogenetic analyses of rodents, marsupials, and bats are being used not only to elucidate their evolutionary relationships, but also to identify concordant patterns of differentiation, and thus historical relationship, among the regions of endemism. Students working under my direction at Chicago, UIC, and NIU expand the scope and depth of these studies. Ecological biogeography is another related interest, seeking insight into the structure and resource use of diverse Neotropical communities through the use of Andean elevational gradients in Chile and Peru. Assessing the relationship between natural distribution patterns and biological conservation in parks and reserves is an on-going concern.

* * *

1989. (with Meserve, P. L. & Lang, B. K.) Distribution and abundance of small mammals along an elevational transect in temperate rainforests of Chile. Journal of Mammalogy 70: 67-78.

1990. (with Patton, J. L.) Fluctuating asymmetry and allozymic heterozygosity among natural populations of pocket gophers (*Thomomys bottae*). Biological Journal of the Linnean Society 40: 21-36.

1991. The integral role of biogeographic theory in the conservation of tropical forest diversity. Pp. 124-149, In: M.A. Mares and D.J. Schmidly (eds.), Latin American mammals: History, Biodiversity, Conservation, University of Oklahoma Press, Norman, OK.

1991. (with V. Pacheco) Phylogenetic relationships of the New World bat genus *Sturnira* (Chiroptera: Phyllostomidae). Bulletin American Museum of Natural History 206: 101-121.

1992. A new genus and species of long-clawed mouse (Rodentia: Muridae) from temperate rainforests of Chile. Zoological Journal of the Linnean Society 106: 127-145.

OLIVIER C. RIEPPEL

Curator, Fossil Amphibians and Reptiles, Department of Geology, Field Museum; Lecturer, Committee on Evolutionary Biology, University of Chicago; Adjunct Professor of Biological Sciences, Northwestern University

Diploma, Zoology, University of Basle, 1974.

M.Sc., Vertebrate Paleontology, University College, London, 1975.

Ph.D., Zoology, University of Basle, 1978.

Foreign Member of the Linnean Society of London, 1992.

Council, Society of Systematic Biologists, 1994.

Associate Editor, Journal of Vertebrate Paleontology, 1993-1995.

North American Editor, Zoological Journal of the Linnean Society, 1992-present.

Comparative and functional anatomy, systematics and evolution of extant reptiles; comparative anatomy and phylogeny of fossil fishes and reptiles; history and philosophy of biology.

My research concentrates on the analysis of phylogenetic relationships of marine Mesozoic reptiles, mostly the Sauropterygia from the German Triassic (Muschelkalk). Parallel studies address problems of skeleton formation in all three major clades of extant reptiles (lizards, crocodiles and turtles), focusing on patterns and sequences of ossification. These developmental data provide the basis for a better understanding of skeletal reduction in secondary marine reptiles, such as the Sauropterygia. Studies in the philosophy and methodology of systematics and its relation to evolutionary theory have resulted in recent papers on problems of homology, historical and conceptual aspects of comparative biology, the meaning of cladistics in paleontology, and the species problem. A field program in the marine Middle Triassic of northwestern Nevada targets the collection of ichthyosaurs and sauropterygians, but has also led to the collection of associated rich and varied fossil fish faunas.

* * *

1993. Studies on skeleton formation in reptiles. IV. The homology of the reptilian (aminote) astragalus revisited. Journal of Vertebrate Paleontology 13: 31-37.

1993. Studies on skeleton formation in reptiles. VII. Patterns of ossification in the skeleton of *Chelydra serpentina* Linnaeus (Reptilia, Testudines). Journal of Zoology, London 231: 487-504.

1993. Euryapsid relationships: a preliminary analysis. Neues Jahrbuch für Geologie und Palaeontologie, Abhandlungen 188: 241-264.

1993. Status of the pachypleorasauroid *Psilotrachelosaurus toeplitzhi* Nopcsa (Reptilia, Sauropterygia), from the Middle Triassic of Austria. Feldiana, Geology, n.s. 27: 1-17.

1993. Die Gliedmassen der Tetrapoden—ein aktuelles Problem der Evolutionsforschung. Naturwissenschaften 80: 295-301.

1993. The conceptual relationship of ontogeny and phylogeny: The taxic approach. In: M. K. Hecht, R. J. MacIntyre and M. T. Clegg (eds.), Evolutionary Biology 27: 1-32.

1993. Evolution—ein metaphysisches Forschungsprogramm? Ethik und Sozialwissenschaften, Wiesbaden 4: 60-62.

1993. Evolutionäre Logik-eine Missgeburt des Zeitgeistes. Ethik und Sozialwissenschaften, Wiesbaden 4: 480-481.

1993. The status of the nothosaurian reptile *Elmosaurus lelmensis*, with comments on *Notosaurus mirabilis*. Palaeontology 36: 967-974.

PETRA SIERWALD

Research Associate, Insects, Zoology, Field Museum of Natural History; Research Associate, Department of Entomology, National Museum of Natural History, Smithsonian Institution; Lecturer, Biological Sciences Collegiate Division, University of Chicago.

M.Sc. (Staatsexamen) in Biology, Geography and Biology-Education; University of Hamburg; June 1982.
Ph.D. (Dr. rer. nat.) in Zoology, University of Hamburg; March 1985.

Postdoctoral Fellow, Smithsonian Institution, Washington, DC, 1985-1986.

Researcher under German National Science Foundation Grant, 1986-1988

Research Associate, Delaware Museum of Natural History, Wilmington, DE, 1989-1990.

Evolution of copulatory organs in spiders; Systematics of the Lycosoidea, especially phylogenetic systematic and biogeography of the spider family Pisauridae

Spiders have the most complex copulatory organs in the animal kingdom, but only recently has it been possible to understand this great diversity of form in terms of homological structures. Using comparative morphological analyses for males and ontogenetic and morphological studies for females, homology-hypotheses for elements of the copulatory organs (ducts and sperm storage containers, fixation devices in the males) are generated. Ontogenetic data for females are obtained through field collecting, research on immatures, and extensive rearing programs. The molted skins containing primordia of the copulatory organs can be easily analyzed with scanning electron microscopy. The data have led to the identification of many apomorphies for groups at various levels, species-groups to major clades containing several superfamilies. Currently, work is underway to determine the mode of development and the plesiomorphic bauplan of the female copulatory organs of the clade Entelegynae, a currently weakly supported group comprising 70% of all known spider families.

My investigations also focus on the function of spiders' copulatory organs. Preliminary studies are underway to freeze copulating spiders in liquid nitrogen and analyze the functional complex of the organs with scanning electron microscopy. This work aims to illuminate speciation processes in spiders and to test the female-choice theory.

Systematics and biogeography of the family Pisauridae are the focus of my taxonomic work. Previous research led to the removal of 10 South American genera from the family as a separate monophyletic group, and resulted in the identification of the *Pisaura* genus-group, containing 15 genera of mainly African-Asian distribution. Work is underway to revise all 15 genera of this group, illuminate the phylogenetic relationships within the group and reconstruct the history of their distribution within a cladistic framework.

* * *

1988. Spiders of Bermuda. *Nemouria* 31: 1-24.

1988. (with J. A. Coddington). Functional aspects of the male palpal organ in *Dolomedes tenebrosus*, with notes on the mating behavior (Araneae, Pisauridae). *Journal of Arachnology* 16: 262-265.

1989. Morphology and ontogeny of female copulatory organs in American Pisauridae, with special reference to homologous features. *Smithsonian Contributions to Zoology* 462: 1-24.

1989. Notes on the behavior of *Thalassius spinosissimus*. *Psyche* 95(2): 243-252.

1990. Morphology and homologous features in the male palpal organs in spiders, with special reference to Pisauridae (Arachnida: Araneae). *Nemouria* 35: 1-70.

1993. Revision of the spider genus *Paradosenus*, with notes on the family Trechaleidae and the subfamily Rhoicininae (Araneae: Lycosoidea). *Review Arachnologique* 10(3): 53-74.

DJAJA DOEL SOEJARTO

Research Associate, Vascular Plants, Botany Department, Field Museum; Associate Professor, University of Illinois Medical Center

B.Sc., Biology Academy, Bogor, Indonesia, 1962.

M.A., Biology, Harvard University, 1965.

Ph.D, Biology, Harvard University, 1969.

Head of Botany Section, University of Antioquia, Medellin, Colombia, 1969-1974.

Adjunct Associate Professor, Department of Pharmacognosy and Pharmacology, University of Illinois Medical Center, 1979-1983.

Associate Professor of Pharmacognosy, Department of Medicinal Chemistry and Pharmacognosy, University of Illinois Medical Center, 1983-present.

Plant systematics of Saurauia (Actinidiaceae); Field surveys for anti-Cancer and anti-AIDS drugs in southeastern Asia; Surveys for naturally occurring sweetening agents in plants; Ethnobotanical field studies in tropical forests.

Field studies in recent years have been in conjunction with National Cancer Institute sponsored programs searching for anti-Cancer and anti-AIDS compounds in plants, particularly in southeastern Asia. Current research includes the intensive sampling of a single forest test-site in order to estimate medicinal potential of rain forests in general. This work includes ethnobotanical work with indigenous people, precise plant-identification, and extensive literature review.

Systematic studies have focused on the taxonomy of the New World species of Saurauia. These trees are an important component of evergreen forests, especially in cooler montane forest formations.

1982. Actinidiaceae. Pp. 1-48, In: G. Harling & B. Sparre (eds.), Flora of Ecuador, No. 17.

1984. Actinidiaceae. Pp. 1-25, In: A. Gomez-Pompa et al. (eds.), Flora de Veracruz (Mexico), fascicle 35.

1986. (with C. Gyllenhaal) Research on Colombian medicinal plants: roles and resources for plant taxonomists. Caldasia 15: 199-217.

1989. (with A. D. Kinghorn) Intensely sweet compounds of natural origin. Medical Research Review 9: 91-115.

1989. Saurauia oroquensis, a new Colombian species of Actinidiaceae. Brittonia 4: 28-31.

1991. (with C. Gyllenhaal, C. Lewandowski, and N. R. Farnsworth) Why do medical sciences need tropical rain forests? Transactions of the Illinois State Academy of Science 84: 65-76.

1991. Medicinal plants of Seberida (Riau Province, Sumatra, Indonesia). Journal of Ethnopharmacology 31: 217-237.

1993. Logistics and politics in plant drug discovery: the other end of the spectrum. Pp. 96-111, In: A. D. Kinghorn and M. F. Balandrin (eds.), Human Medicinal Agents from Plants, ASC Symposium Series, American Chemical Society, Washington DC.

MARGARET K. THAYER

Research Associate, Insects, Department of Zoology, Field Museum

Sc.B., Biology, Brown University, 1973.

Ph.D., Biology, Harvard University, 1985.

Visiting Assistant Curator, Field Museum, 1988-1992.

Advisory Panel, Biotic survey and Inventory Program, National Science Foundation, 1991, 1994.

Editorial Board, Annals of the Entomological Society of America.

International Editorial Board, Annales Zoologici.

President-Elect, Coleopterists Society (President 1995-1996).

Treasurer, Coleopterists Society, 1987-1991.

Systematics, biology, and evolution of world Staphylinidae (especially Omaliinae); Historical biogeography, especially of austral regions; Faunistic studies of southern hemisphere temperate Staphyliniformia

Research has focused on the systematics, evolution, and biogeography of basal elements of the large and ancient beetle family Staphylinidae (rove beetles). Many of these lineages are restricted to either northern or southern temperate areas of the world. A major work in progress on the 40+ genera of the tribe Omaliini will begin to make that worldwide, mainly temperate-zone, group accessible for phylogenetic and large-scale historical biogeographic studies.

Taxonomically broader fieldwork-based faunistic work on the southern continents, presently concentrating on Australia, is another part of my research program, in collaboration with A. F. Newton. The staphyliniform faunas of Australia, New Zealand, Chile, and South Africa are highly endemic at the specific level, but strongly interconnected at generic and higher levels. This work is expanding knowledge of the diversity, distribution, and biology of the Staphyliniformia of those regions and also, in the long term, knowledge of apparently ancient biogeographic relationships among the regions.

* * *

1979. (with A. F. Newton, Jr.) Revision of the south temperate genus *Glypholoma* Jeannel, with four new species (Coleoptera: Staphylinidae: Omaliinae). Psyche 85: 25-63.

1985. The larva of *Brathinus nitidus* LeConte and the systematic position of the genus (Coleoptera: Staphylinidae). Coleopterists Bulletin 39(2): 174-184.

1985. Revision, phylogeny, and biogeography of the austral genus *Metacorneolabium* Steel (Coleoptera: Staphylinidae, Omaliinae). Pp. 113-179 In: G. E. Ball, (ed.), Taxonomy, phylogeny, and zoogeography of beetles and ants. A volume dedicated to the memory of Philip Jackson Darlington, Jr. 1904-1983. Series Entomologica 33, Dr. W. Junk Publishers, Dordrecht.

1987. Biology and phylogenetic relationships of *Neophonus bruchi*, an anomalous south Andean staphylinid (Coleoptera). Systematic Entomology 12: 389-404.

1992. (with A. F. Newton, Jr.) Current classification and family-group names in Staphyliniformia (Coleoptera). Fieldiana, Zoology, New Series, No. 67: iv + 92 pp.

1992. Discovery of sexual wing dimorphism in Staphylinidae (Coleoptera): "*Omaliium*" *flavidum*, and a discussion of wing dimorphism in insects. Journal of the New York Entomological Society 100(4): 540-573.

WILLIAM D. TURNBULL

Curator Emeritus, Fossil Mammals, Department of Geology, Field Museum of Natural History; Lecturer, Committee on Evolutionary Biology, University of Chicago; Research Associate, University of Texas (Texas Memorial Museum)

Ph.D., University of Chicago, 1967.

Bibliographic compiler for *Saugetierkundliche Mitteilungen* from 1955-65.

Vice-president and President of the Society of Vertebrate Paleontology, 1976-1977, 1977-1978.

Co-leader, two small expeditions to Australia (1963-4), (1976-7) and many field trips into the Washakie Basin of Wyoming (1956-89).

Mammalian systematics, evolution, ecology and zoogeography, especially North American Eocene and Mesozoic faunas, Australian Tertiary faunas; functional morphology of mammalian masticatory apparatus; paleopathology; taphonomy; basicranial anatomy of edentates; group origins and replacements

Current research involves i) Late Tertiary and Pleistocene mammalian faunas of Australia (5 papers), ii) the mammalian fauna of the Washakie Fm. (SW Wyoming) and the stratigraphic sequence of the deposits of the formation (9 works in progress), iii) functional anatomy and restoration of the masticatory apparatus of an Eocene taeniodont, iv) studies of the Late Pleistocene short-faced bear *Arctatus* (one a descriptive morphologic and geographic treatment, the other a differential diagnosis of its disease condition), v) report of the multituberculates of the Early Cretaceous Trinity Fm. of N Texas, vi) the ear region of pilosans (with T. Gaudin, Organismal Biology and Anatomy).

Interested in supervising research on marsupial paleontology, systematics, development, ecology and zoogeography, and on N. Amer. Eocene archaic mammals, rodents, perissodactyls.

* * *

1990. (with E.L. Lundelius, Jr., and R.H. Tedford) Fossil mammals of the Coimadai Local Fauna near Bacchus Marsh, Victoria. DeVis Symposium Volume. *Memories of the Queensland Museum* 28(1): 223-245, figs. 1-14. Brisbane.

1991. *Protoptychus hatcheri* Scott, 1895: The mammalian faunas of the Washakie Formation, Eocene Age, of southern Wyoming. Part II. The Adobetown Member, middle division (=Washakie B), TWka/2 (in part). *Fieldiana, Geology, n.s.* 21: 1-33.

1992. (with B. Patterson, W. Segall and T. Gaudin) The ear region in Xenarthrans (Edentates: Mammalia). Part II. Pilosa: sloths, anteaters, paleanodonts and a miscellany. *Fieldiana, Geology, n.s.* 24: 1-79.

1992. (with E. L. Lundelius, Jr., and R. H. Tedford) A Pleistocene marsupial fauna from Limeburner's Point, Victoria, Australia. C.A.V.E.P.S. Volume, Proceedings of 1991 meeting. *Records of the Northern Territory Museum (The Beagle)* 9(1): 143-171, figs. 1-19.

1993. (with E. L. Lundelius, Jr. and R. H. Tedford) Plio-Pleistocene mammalian fauna at Smeaton, Victoria. Pp. 429-440. In: P.A. Fell. (ed.) Ken Campbell Festschrift, *Assoc. Austral. Pal.* Brisbane. .

JANET R. VOIGHT

Assistant Curator, Invertebrates, Department of Zoology, Field Museum; Lecturer, Committee on Evolutionary Biology, University of Chicago.

B.S. Biology, Iowa State University, 1977.

Ph. D. Ecology and Evolutionary Biology, University of Arizona, 1990.

Systematics and evolution of Incirrate octopods.

My research focuses on cephalopod mollusks, squids, octopuses and cuttlefishes, cosmopolitan marine animals. Study of cephalopods offers to reveal patterns of biogeographical relationships among oceanic areas and how evolution has allowed these animals to exploit all ocean depths. Quantitative analysis and anatomical studies are proving to be important tools for understanding how these animals live in the deep sea and how they have evolved to occupy what to us is the least desirable habitat on earth. In addition to furthering our understanding of cephalopod biology, and perhaps to understand why virtually all members of the group appear to die after a single reproductive episode, my research program aims to produce a better understanding of the diversification of marine animals through time and space.

* * *

1991. Morphological Variation in Octopod specimens: Reassessing the assumption of preservation-induced deformation. Malacologia 33: 241-253.

1991. Enlarged suckers as an indicator of male maturity in Octopus. Bulletin of Marine Science 49: 98-106.

1991. Ligula length and courtship in *Octopus digueti*: A potential mechanism of mate choice. Evolution 45: 1726-1730.

1992. Movement, injuries and growth of members of a natural population of the Pacific pygmy octopus, *Octopus digueti*. Journal of Zoology, London 228: 247-263.

1993. A Cladistic Reassessment of Octopodid subfamilies. Malacologia 35: 343-349.

1993. The arrangement of suckers on octopodid arms as a continuous character. Malacologia 35: 351-359.

1993. The association between distribution and octopodid morphology: Implications for classification. The Zoological Journal of the Linnean Society 108: 209-223.

1994. Morphological variation in shallow-water octopuses (Mollusca: Cephalopoda). Journal of Zoology, London. (in press).

HAROLD K. VORIS

Curator and Head, Amphibians and Reptiles, Department of Zoology, Field Museum; Lecturer, Committee on Evolutionary Biology, University of Chicago

B.A., Biology, Hanover College, 1962.

Ph.D., Biology Department, University of Chicago, 1969.

Hanover College Alumni Achievement Award, 1983.

Ecology and systematics of marine snakes/coevolution of pedunculate barnacles and decapod crustaceans/comparisons of old-world tropical rain forest amphibian and reptile communities.

I am currently pursuing three research topics, all collaborative and based in southeast Asia. In the lowland tropical rain forests of Borneo, Bob Inger and I are studying the natural changes in communities of amphibians and reptiles that occur over time and differences in these communities that occur from place to place. This year comparisons between logged forests and undisturbed forests are adding another dimension to the comparisons.

In the Pulau Tiga marine park off the north coast of Borneo, Rob Stuebing, myself and students, are exploring the ecology of the banded sea krait, an amphibious sea snake. Our plan is to investigate the plasticity in several life history traits over its huge geographic range that straddles the equator.

In the Straits of Johore between Malaysia and Singapore and in Thailand, we (Jeffries, Voris and Yang) are trying to understand the degree to which coevolution has occurred in a symbiotic relationship that exists between pedunculate barnacles, on the one hand, and crabs and snakes, on the other. Recently our work on the mechanisms of colonization of the edible crab by barnacles was completed and we are now looking at colonization patterns and the effect of these patterns on fecundity.

I would welcome the opportunity to help guide student research projects that pertain to topics generally related to the research described above.

* * *

1981. (with C. A. Lemen) A comparison of reproductive strategies among marine snakes. Journal of Animal Ecology 50: 89-101.

1983. (with H. H. Voris) Feeding strategies in marine snakes: an analysis of evolutionary, morphological, behavioral and ecological relationships. American Zoologist 23 (2): 411-425.

1986. (with R.F. Inger and K.J. Frogner) Organization of a community of tadpoles in rain forest streams in Borneo. Journal of Tropical Ecology 2:193-205.

1989. (with W.B. Jeffries and C.M. Yang) A new mechanism of host colonization: pedunculate barnacles of the genus Octolasmis on the mangrove crab, Scylla serrata. Ophelia 31(1):51-58.

1991. (with E.A. Lading and R.B. Stuebing) A population size estimate of the yellow-lipped sea krait, Laticauda colubrina, on Kalampunian Damit island, Sabah, Malaysia. Copeia (4):1139-1142.

1993. (with R.F. Inger) A comparison of amphibian communities through time and from place to place in Bornean forests. Journal of Tropical Ecology 9: 409-433.

MARK W. WESTNEAT

Assistant Curator and Head, Fishes, Department of Zoology, Field Museum

B.A., Biology, The College of Wooster, 1984.

Ph.D., Zoology, Duke University, 1990.

D. Dwight Davis Award, American Society of Zoologists, 1990.

Raney Award in Ichthyology, American Society of Ichthyologists and Herpetologists, 1988.

Nomination by American Association of Museums for NSF's Alan T. Waterman Award, 1993.

Functional morphology of vertebrates, with emphasis on behavioral kinetics and muscle physiology during feeding and locomotion.

Current studies address the integration of phylogenetic systematics with comparative biomechanics and functional morphology. My research goals in systematics include the resolution of relationships among species and higher level taxa in the fishes of the tropical, marine family Labridae (the wrasses). Character analysis of labrid fishes to date has followed a traditional morphological focus, but data are now being sought from color patterns, behavior, function, and perhaps molecules in an attempt to establish a broad character data base to aid tree construction among the 600 labrid species. The functional morphology of feeding and locomotion in living fishes is being studied by high speed film and video analysis of behavior. Using comparative anatomy, theory from mechanical engineering, and new image and motion analysis techniques, the musculoskeletal mechanisms of feeding and swimming are being described in fishes of the Labridae, Carangidae, and Scombridae. The goal is to document the mechanisms of force transfer from muscle through connective tissue to skeleton in feeding and locomotor systems. Combined with a phylogenetic hypothesis, this research program tries to clarify the patterns of evolution of functional systems in fishes.

* * *

1990. Feeding mechanics of teleost fishes (Labridae: Perciformes): A test of four-bar linkage models. Journal of Morphology 205: 269-295.

1991. Linkage biomechanics and evolution of the jaw protrusion mechanism of the sling-jaw wrasse, *Epibulus insidiator*. Journal of Experimental Biology 159: 165-184.

1992. (with W.G. Hall) Ontogeny of feeding motor patterns in infant rats: an electromyographic study of suckling and chewing. Behavioral Neuroscience 106: 539-554.

1992. (with S. Nowicki and W. Hoese) Birdsong: motor function and the evolution of communication. Seminars in the Neurosciences 4: 385-390.

1993. (with W. Hoese, C. A. Pell, and S. A. Wainwright) The horizontal septum: mechanisms of force transfer in the locomotion of scombrid fishes (Scombridae, Perciformes). Journal of Morphology 217: 183-204.

1993. (with J. H. Long, B. Hoese and S. Nowicki) Kinematics of birdsong in sparrows: functional correlates of beak and head motion. Journal of Experimental Biology 182: 147-171.

1993. A phylogenetic hypothesis for the tribe Cheilini (Labridae: Perciformes). In: Proceedings of the ASIH symposium on Percomorph phylogeny, D. Johnson (ed.). Bulletin of Marine Science 52:351-394.

1994. (in press) Systematics and biomechanics in ecomorphology. In: Luczkovich, J., Motta, P., and S. Norton, eds. Symposium on the ecomorphology of fishes Environmental Biology of Fishes.

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(publications with 1993 dates—excluding abstracts)

DEPARTMENT OF BOTANY

Fred R. Barrie

(with L. J. Dorr) Typification of Linnaean names in *Pyrola* (Ericaceae, Pyroloideae). Brittonia 45: 177-180.

(with C. E. Jarvis, D. M. Allan and J. L. Reveal) A list of Linnaean generic names and their types. Regnum Vegetabile 127: 1-100.

William Burger

(with Charlotte Taylor) Family # 202, Rubiaceae, Flora Costaricensis. Fiediana Botany, n.s. 33: 1-333.

Michael O. Dillon

Análisis florístico del Bosque Monteseco (Cajamarca, Perú) e implicancias para su conservación. Arnaldoa 1(3): 45-63.

(with N. Hensold) Family Asteraceae. Pp. 103-189. In: L. Brako and J. L. Zarucchi (eds.). Catalogue of the Flowering Plants and Gymnosperms of Peru. Monographs in Systematic Botany, Missouri Botanical Garden 45.

(with M. Muñoz-Schick) A revision of the dioecious genus *Griselinia* (Griselinaceae), including a new species from the coastal Atacama Desert of northern Chile. Brittonia 45: 261-274.

John Engel

Index Hepaticarum Supplementum: 1986-1987. Taxon 42: 373-391.

Studies on Geocalycaceae. IX. *Chiloscyphus hattorii* Engel, a new species from New Zealand, together with nomenclatural refinements in Australasian *Heteroscyphus* and *Leptoscyphus*. Journal of the Hattori Botanical Laboratory 74: 29-33.

Nancy Hensold

(with M.O. Dillon) Family Asteraceae. Pp. 103-189. In: L. Brako and J. L. Zarucchi (eds.). Catalogue of the Flowering Plants and Gymnosperms of Peru. Monographs in Systematic Botany, Missouri Botanical Garden 45.

Thomas G. Lammers

(with A. K. Pandey and A. Jha) Sporogenesis and gametogenesis in Pacific island *Lobelia* (Campanulaceae-Lobelioideae). Phytomorphology 42: 63-69.

A new species of *Siphocampylus* (Campanulaceae: Lobelioideae) from northern Peru. Brittonia 45: 28-31.

Lobelia bridgesii, Campanulaceae. Kew Magazine 10: 70-75, pl. 220.

Chromosome numbers of Campanulaceae. III. Review and integration of data for subfamily Lobelioideae. American Journal of Botany 80: 660-675.

The correct name for Taiwanese *Campanula* (Campanulaceae). Botanical Bulletin of Academia Sinica 34: 287-288.

(with D. C. Kama and N. R. Morin) Campanulaceae. Pp. 310-326. In: L. Brako and J. L. Zarruchi, (eds.), Catalogue of the Flowering Plants and Gymnosperms of Peru. Monographs in Systematic Botany, Missouri Botanical Garden 45.

(with D. H. Lorence) A new species of *Cyanea* (Campanulaceae: Lobelioideae) from Kauai, and the resurrection of *C. remyi*. Novon 3: 431-436.

(with T. J. Givnish and K. J. Sytsma) Merger of the endemic Hawaiian genera *Cyanea* and *Rollandia* (Campanulaceae: Lobelioideae). Novon 3: 437-441.

Gregory M. Mueller

(with G. J. Mueller, L. Shih and J. F. Ammirati) Cytological Studies in *Laccaria* (Agaricales). I. Meiosis and postmeiotic mitosis. American Journal of Botany 80: 316-321.

(with J. F. Ammirati) Cytological studies in *Laccaria* (Agaricales). II. Assessing phylogenetic relationships among *Laccaria*, *Hydnangium*, and other Agaricales. American Journal of Botany 80: 322-329.

(with A. von Hofsten, A. Axén and B. A. Strack) Basidiospore wall ultrastructure of the false-truffle *Hydnangium* and its phylogenetic significance. Mycologia 85: 890-893.

(with C. B. Fischbein, J. W. Lipscomb and J. B. Leikin) Field test of the new fungal identification system in Poisindex. Veterinary and Human Toxicology 35: 204-206.

Gary L. Smith Merrill

New Records for Kansas Mosses, IV. Evansia 10: 72-76.

Contribution to the bryophyte flora of the Lake Erie Islands. Evansia 10: 114-120.

Robert G. Stolze

(with R. M. Tryon and B. León) Pteridophyta of Peru, Part V 18. Aspleniaceae-21. Polypodiaceae. Fieldiana, Botany, n.s. 32: 1-190.

DEPARTMENT OF GEOLOGY

Ignacio Casanova

Thermodynamics of silicon distribution in meteoritic metallic phases. III Congress Geologica España 2: 535-538. (in Spanish, with English abstract)

(with L. Grossman) Distribution of vanadium and melting of opaque assemblages in Efremovka CAIs. Lunar Planetary Science 24: 257-258.

(with K. Keil and H. E. Newsom) Composition of metal in aubrites: constraints on core formation. Geochimica et Cosmochimica Acta 57: 675-682.

(with J. Llorca) Influence of impact processes in the formation of the terrestrial planets—I: The geochemical nature of the planet Mercury. III Congress Geologica España 2: 539-541. (in Spanish, with English abstract)

(with T. J. McCoy and K. Keil) Metal-rich meteorites from the aubrite parent body. Lunar Planetary Science 24: 259-260.

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Peter R. Crane

(with K. R. Pedersen, E. M. Friis and A. N. Drinnan) The earliest platanoids: Fossil inflorescences and leaves from the Potomac Group (Early Cretaceous, Middle Albian) of eastern North America. Systematic Botany 18: 328-344.

(with K.R. Pedersen and E. M. Friis) Pollen organs and seeds with *Decussosporites* Brenner from Lower Cretaceous Potomac Group sediments of eastern USA. Grana 32: 273-289.

Magnoliophyta. Pp. 251-253, In: McGraw-Hill Yearbook of Science and Technology, 1994.

Time for the angiosperms. Nature 366: 631-632.

John J. Flynn

(with A. R. Wyss) A phylogenetic analysis and definition of the Carnivora. Pp. 32-52. In: F. Szalay, M. Novacek and M. McKenna (eds.), Mammal Phylogeny: Placentals, Springer-Verlag.

(with A. R. Wyss, M. A. Norell, C. C. Swisher III, R. Charrier, M. J. Novacek and M. C. McKenna) South America's earliest rodent and recognition of a new interval of mammalian evolution. Nature 365: 434-437.

Lance Grande

(with N. Micklich) Paleobiogeography of the Messel and Geiseltal fish faunas. Symposium volume on Grube Messel Perspectives and Relationships. Kaupia 3: 1-8.

Patrick Herendeen

(with W. L. Crepet and K. C. Nixon) *Chloranthus*-like stamens from the Upper Cretaceous of New Jersey. American Journal of Botany 80: 865-871.

Scott Lidgard

(with F. K. McKinney and P. D. Taylor) Competition, clade replacement, and a history of cyclostome and cheilostome bryozoan diversity. Paleobiology 19: 352-371.

Matthew H. Nitecki

(with D. V. Nitecki, eds.) Evolutionary Ethics. SUNY Press.

An agenda for antiquity. Quarterly Review of Biology 68(1): 89-90.

Problematic worldview of evolutionary ethics. Pp. 3-26. In: M.H. Nitecki and D.V. Nitecki (eds.), Evolutionary Ethics. SUNY Press.

Olivier C. Rieppel

Studies on skeleton formation in reptiles. II. The postembryonic development of the skeleton in *Chamaeleo hoehneltii* (Reptilia: Chamaeleoninae). Herpetologica 49: 66-78.

Studies on skeleton formation in reptiles. IV. The homology of the reptilian (aminote) astragalus revisited. Journal of Vertebrate Paleontology 13: 31-37.

Patterns of Diversity in the Reptilian Skull, pp. 344-390. In: J. Hanken and B. K. Hall (eds.), *The Skull*, Vol. 2. Patterns of Structural and Systematic Diversity. The University of Chicago Press.

Studies on skeleton formation in reptiles. Patterns of ossification in the skeleton of *Alligator mississippiensis* Daudin (Reptilia, Crocodylia). Zoological Journal of the Linnean Society 109.

Studies on skeleton formation in reptiles. VII. Patterns of ossification in the skeleton of *Chelydra serpentina* Linnaeus (Reptillia: Testudines). Journal of Zoology, London 231: 487-504.

Euryapsid relationships: a preliminary analysis. Neues Jahrbuch für Geologie und Palaeontologie, Abhandlungen 188: 21-41-264.

Status of the pachypleorasauroid *Psilotrachelosaurus toeplitzschii* Nopcsa (Reptilia, Sauropterygia), from the Middle Triassic of Austria. Fieldiana, Geology, n.s. 27: 1-17.

Die Gliedmassen der Tetrapoden—ein aktuelles Problem der Evolutionsforschung. Naturwissenschaften 80: 295-301.

The conceptual relationship of ontogeny and phylogeny: The taxic approach. Pp. 1-32. In: M. K. Hecht, R. J. MacIntyre and M. T. Clegg (eds.), Evolutionary Biology 27: 1-32. Plenum Press, New York.

Evolution—ein metaphysisches Forschungsprogramm? Ethik und Sozialwissenschaften, Wiesbaden 4: 60-62.

Evolutionäre Logik—eine Missgeburt des Zeitgeistes. Ethik und Sozialwissenschaften, Wiesbaden 4: 480-481.

The status of the nothosaurian reptile *Elmosaurus lelmensis*, with comments on *Notosaurus mirabilis*. Palaeontology 36: 967-974.

Homologie—Logik und Geschichte. In: Weingarten, M. and W.F. Gutmann (eds.), Geschichte und Theorie des Vergleichs in den Biowissenschaften. Aufsätze und Reden der Senckenbergischen Naturforschenden Gesellschaft 4: 155-173.

William Turnbull

(with E. L. Lundelius and R. H. Tedford) Plio-Pleistocene mammalian fauna at Smeaton, Victoria. Pp. 429-440. P. A. Jell (ed.), Ken Campbell Festschrift, Association of Australasian Paleontologists, Brisbane.

Rainer Zangerl

(with H. F. Winter and M. C. Hansen) Comparative Microscopic Dental Anatomy in the Petalodontida (Chondrichthyes, Elasmobranchii). Fieldiana, Geology, n.s. 26: 1-43.

DEPARTMENT OF ZOOLOGY

Rüdiger Bieler

(with P. M. Mikkelsen and R. E. Petit) A bibliography of Caribbean malacology 1826-1993. American Malacological Bulletin 10(2): 267-290.

Ampullariid Phylogeny—Book review and cladistic reanalysis. The Veliger 36(3): 291-297.

Architectonicidae of the Indo-Pacific (Mollusca, Gastropoda). Abhandlungen des Naturwissenschaftlichen Vereins in Hamburg (NF) 30: 1-376.

Barry Chernoff

(with A. Machado-Allison, P. A. Buckup and R. Royero-León) Las especies del género *Bryconops* Kner (1858) en Venezuela (Teleostei, Characiformes). Acta Biologica Venezuelica 14(3): 1-20.

(with R. Royero-León and A. Machado-Allison) Peces del Rio Atabapo, Territorio Federal Amazonas, Venezuela. Acta Biologica Venezuelica 14(1): 41-55.

Jack Fooden

(with G. H. Albrecht) Latitudinal and insular variation of skull size in crab-eating macaques (Primates, Cercopithecidae: *Macaca fascicularis*). American Journal of Physical Anthropology 92(4): 521-538.

Steven M. Goodman

A reconnaissance of Isle Saint Marie, Madagascar: the status of the forest, avifauna, lemurs, and fruit bats. Biological Conservation 65: 205-212.

(with N. R. Ingle). Sibuyan Island in the Philippines — threatened and in need of conservation. Oryx 27: 174-180.

(with O. Langrand and C. Raxworthy). The food habits of *Asio madagascariensis* in two different forest types in southern Madagascar. Ostrich 64: 79-85.

(with O. Langrand). Food habits of the Barn Owl (*Tyto alba*) and the Madagascar Long-Eared Owl (*Asio madagascariensis*) on Madagascar: adaptation to a changing environment. Pp 147-153, In: R. T. Wilson (ed.), Proceedings of the 8th Pan-African Ornithological Congress, Annales Musée Royal de l'Afrique Centrale (Zoologie).

(with S. O'Conner and O. Langrand). A review of predation on lemurs: implications for the evolution of social behavior in small nocturnal primates. In: P. M. Kappeler and J. U. Ganzhorn (eds.), Lemur social systems and their ecological basis. Plenum Press, New York.

(with T. S. Schulenberg and J. C. Razafimahaimodison). Genetic variation in two subspecies of *Nesillas typica* (Sylviinae) in south-east Madagascar. Pp. 173-178, In: R. T. Wilson (ed.), Proceedings of the Eight Pan-African Ornithological Congress. Annales Musée Royal de l'Afrique Centrale (Zoologie).

(with R. C. Banks, T. S. Schulenberg and S. M. Lanyon). Principles of avian taxonomy. Auk 110: 413-414.

Lawrence Heaney

(with D. S. Balete, H. C. Miranda and J. F. Reiger) Diversity and conservation of Philippine land vertebrates: an annotated bibliography. Silliman Journal 36: 129-149.

(with P. D. Heideman and J. A. Cummings) Observations on reproductive timing and early embryonic development in an Old World fruit bat, *Otopteropus cartilagonodus* (Megachiroptera). Journal of Mammalogy 74: 621-630.

(with R. S. Hoffmann, C. G. Anderson and R. W. Thorington, Jr.) Family Sciuridae. Pp. 419-465, In: D. Wilson and D.M. Reeder, (eds.), Mammal Species of the World, a taxonomic and geographic reference, Second ed. Smithsonian Institution Press, Washington, D.C.

(with A. T. Peterson) Genetic differentiation in Philippine bats of the genera *Cynopterus* and *Haplonycteris*. Biological Journal Linnean Society 49: 203-218.

(with E. A. Rickart, P. D. Heideman and R. C. B. Utzurrum) The distribution and ecology of mammals on Leyte, Biliran, and Maripipi islands, Philippines. Fieldiana, Zoology, n.s. 72: 1-62.

Robert Inger

(with G. F. Wu, E. M. Zhao and H. B. Shaffer) A new frog of the genus *Oreolalax* (Pelobatidae) from Sichuan, China. Journal of Herpetology 27: 410-413.

(with H. K. Voris) A comparison of amphibian communities through time and from place to place in Bornean forests. Journal of Tropical Ecology 9: 409-433.

Julian C. Kerbis Peterhans

(with R. W. Wrangham, M. L. Carter and M. D. Hauser). A contribution to tropical rain forest taphonomy: retrieval and documentation of chimpanzee remains from Kibale Forest, Uganda. Journal of Human Evolution 25: 485-514.

John Kethley

(with W. A. Bruce and M. J. Kaliszewski) Morphology of the gnathosoma of *Pyemotes tritici*: Cheliceral Stylets and an associated cheliceral structure (Acari: Pyemotidae). International Journal of Acarology 19(2): 1-10.

(with W.A. Bruce) Morphology of the gnathosoma of *Acarapis woodi* (Acari: Acarapidae). International Journal of Acarology 19(3): 243-247.

(with R. A. Norton, D. E. Johnston and B. M. O'Connor) Phylogenetic Perspectives on Genetic Systems and Reproductive Modes of Mites. Pp. 8-99, In: D. L. Wrensch and M. Ebbert, (eds.), Evolution and Diversity of Sex Ratio: Insects and Mites, Chapman & Hall, New York.

Scott M. Lanyon

Phylogenetic frameworks: Towards a firmer foundation for the comparative approach. Biological Journal of the Linnean Society 49: 45-61.

(with R. C. Banks, S. M. Goodman and T. S. Schulenberg) Type specimens and Principles of Avian Taxonomy. Auk 110: 413-414.

Peter E. Lowther

Brown-headed Cowbird. Pp. 1-24, In: A. Poole & F. Gill (eds.), The Birds of North America, No. 47. Philadelphia: The Academy of Natural Sciences and Washington, DC: The American Ornithologists' Union.

Tallgrass Prairie I-III [Breeding Bird Census]. Journal of Field Ornithology 64 (supplement): 103-104.

Alfred Newton

Leptusa alpicola Brancsik: dual lectotype designations (Coleoptera: Staphylinidae). Coleopterists Bulletin 47: 34.

(with J. S. Ashe) Larvae of *Trichophya* and phylogeny of the tachyporine group of subfamilies (Coleoptera: Staphylinidae) with a review, new species and characterization of Trichophyinae. Systematic Entomology 18: 267-286.

Bruce D. Patterson

Babbit plan [commentary]. In the Field for May/June 1993: 1-10.

(with W. Atmar) The measure of order and disorder in the distribution of species in fragmented habitat. Oecologia 96: 373-382.

(with V. Pacheco) Systematics and biogeographic analyses of four species of *Sturnira* (Chiroptera: Phyllostomidae), with emphasis on Peruvian forms. Pp. 57-81, In: K. R. Young and N. Valencia (eds.), Biogeografía, ecología, y conservación del bosque montaño en el Perú Memorias del Museo de Historia Natural, Universidad Nacional Mayor de San Marcos 21.

(with V. Pacheco, J. L. Patton, L. H. Emmons, S. Solari and C. Ascorra) List of mammal species known to occur in Manu Biosphere Reserve, Peru. Publicaciones del Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Serie A Zool. 44:1-12.

(with V. Pacheco and M. V. Ashley) On the origins of the Western Slope region of endemism: systematics of fig-eating bats, genus *Artibeus*. Pp. 189-205, In: K. R. Young and N. Valencia (eds.), *Biogeografía, ecología, y conservación del bosque montaño en el Perú* Memorias del Museo de Historia Natural, Universidad Nacional Mayor de San Marcos 21.

(with R. Hutterer) The roles of museums. Trends in Evolution and Ecology 9(2): 64.

A. Townsend Peterson

Phylogeny and rates of molecular evolution in the *Aphelocoma* jays (Corvidae). Auk 109: 133-147.

Genetic differentiation in Philippine bats of the genera *Cyanoptyrus* and *Haplonycterus*. Biological Journal of the Linnean Society 49: 203-218.

Adaptive geographical variation in bill shape of scrub jays (*Aphelocoma coerulescens*). American Naturalist 142:508-527.

Thomas S. Shulenberg

Phylogeny of the Vanginae: inferences from mitochondrial DNA. Pp. 23-28, In: R. T. Wilson (ed.), *Proceedings of the Eighth Pan-African Ornithological Congress*. Annales Musée Royal de l'Afrique Centrale (Zoologie).

(with S. M. Goodman and J. C. Razafimahaimodison). Genetic variation in two subspecies of *Nesillas typica* (Sylviinae) in south-east Madagascar. Pp. 173-178, In: R. T. Wilson (ed.), *Proceedings of the Eight Pan-African Ornithological Congress*. Annales Musée Royal de l'Afrique Centrale (Zoologie).

(with R. C. Banks, S. M. Goodman, and S. M. Lanyon). Principles of avian taxonomy. Auk 110: 413-414.

Petra Sierwald

Revision of the spider genus *Paradosenus*, with notes on the family Trechaleidae and the subfamily Rhoicininae (Araneae: Lycosoidea). Review Arachnologique 10(3): 53-74

Alan Resetar

The eastern massasauga (*Sistrurus c. catenatus*) in Indiana: A preliminary historical survey. Pp. 138-141, In: B. Johnson and V. Menzies (eds.), International symposium and workshop on the conservation of the eastern massasauga rattlesnake. Metro-Toronto Zoo, Canada.

Margaret K. Thayer

Osellia zanetti a junior synonym of *Orochares* Kraatz, with a checklist of *Orochares* species (Coleoptera: Staphylinidae: Omaliinae). Coleopterists Bulletin 47: 285-287.

Janet Voight

The association between distribution and octopodid morphology: Implications for classification. Zoological Journal of the Linnean Society 108: 209-223.

The arrangement of suckers on octopodid arms as a continuous character. Malacologia 35: 351-359.

A cladistic reassessment of octopodid subfamilies. Malacologia 35: 343-349.

Review: "Larval" and juvenile cephalopods: a manual for their identification. M. J. Sweeney, C. F. E. Roper, K. M. Mangold, M. R. Clarke and S. v. Boletzky, (eds.), *Smithsonian Contributions to Zoology* 513. The Veliger 36: 433-434.

Harold K. Voris

(with R. F. Inger) A comparison of amphibian communities through time and from place to place in Bornean forests. Journal of Tropical Ecology 9: 409-433.

Mark W. Westneat

Phylogenetic relationships of the tribe Cheilininini (Labridae: Perciformes). Bulletin of Marine Science 52: 351-394.

(with W. Hoese, C. A. Pell, and S. A. Wainwright) The horizontal septum: mechanisms of force transfer in the locomotion of scombrid fishes (Scombridae, Perciformes). Journal of Morphology 217: 183-204.

(with J. H. Long, W. Hoese and S. Nowicki) Kinematics of birdsong: functional correlation of cranial movements and acoustic features in sparrows. Journal of Experimental Biology 182: 147-171.

CEEB, ACTIVE GRANTS, 1993

DEPARTMENT OF BOTANY

Michael O. Dillon

National Geographic Society: "Floristic Inventory—Northern Peru" \$18,950 NGS-4510-91 (1991-1993).

John Engel

National Science Foundation: "Curatorial Support for the Field Museum Herbarium," \$655,153 BSR-9021960 (1991-1994), (with C. Niezgoda).

Gregory M. Mueller

National Science Foundation: "Agaricales of Costa Rican Quercus Forests" \$401,018 DEB-9300798 (1993-1997).

Christine Niezgoda

National Science Foundation: "Curatorial Support for the Field Museum Herbarium," \$655,153 BSR-9021960 (1991-1994), (with J. Engel).

DEPARTMENT OF GEOLOGY

John R. Bolt

National Science Foundation: "Mississippian Fossil Tetrapods from Midcontinental USA and Early-Tetrapod Phylogeny" \$20,000 DEB-9207475 (1992-1994), (with R. E. Lombard).

National Science Foundation: "Mississippian Fossil Tetrapods from Midcontinental North America and Early-Tetrapod Phylogeny" \$119,996 DEB-9306294 (1993-1995), (with R. E. Lombard).

Peter R. Crane

National Science Foundation: "Systematics, Floral Structure and Reproductive Biology of Mid-Cretaceous Magnoliid Angiosperms" \$210,923 DEB-9020237 (1991-1994).

National Science Foundation: "Major Patterns in the Phylogeny of Flowering Plants: Floral Development and Relationships Among 'Basal' Non-Magnoliid Dicotyledons" \$10,110 INT-9015123 (1991-1994).

American Chemical Society, Petroleum Research Fund: "Global Patterns of Cretaceous Vegetational Change" \$40,000 PRF-24025-AC8 (1991-1993), (with S. Lidgard).

National Science Foundation: "Doctoral Dissertation Improvement Award to Jane Masterson" \$4,801 DEB 9112358 (1992-1993).

John J. Flynn

National Science Foundation: "Collaborative Research: A New Paleogene Fauna from the Chilean Andes: A Critical Interval in South American Faunal History" Subcontract (American Museum of Natural History) \$18,552.

National Science Foundation: "Collaborative Research: A New Paleogene Fauna from the Chilean Andes: A Critical Interval in South American Faunal History" Subcontract (University of California, Santa Barbara) \$15,000.

Lance Grande

National Science Foundation: "Systematics, Ontogeny, Osteology and Historical Biogeography of Living and Fossil Bowfins (Actinopterygii: Amiiformes) \$226,638 DEB-9119561 (1992-1995), (with W. Bemis).

National Science Foundation: "Comparative Embryology of the Adenohypophysis of Actinopterygian Fishes" \$265,000 DEB-9220938 (1993-1996), (with W. Bemis).

Lawrence Grossman (Research Associate)

National Aeronautics and Space Administration: "Emergency Funding for an Interim Curator of Meteorites" \$79,898 NAGW-2728 (1992-1994).

Sara Hoot

National Science Foundation: "Phylogenetic Relationships of the Ranunculidae and Basal Hamamelidae: Implications for the Early Evolution of Non-magnoliid Dicotyledons" \$124,645 DEB9306533 (1993-1995).

Scott Lidgard

American Chemical Society, Petroleum Research Fund: "Global Patterns of Cretaceous Vegetational Change" \$40,000 PRF-24025-AC8 (1991-1993), (with P. R. Crane).

National Science Foundation: "Comparing Zooid and Colony Evolution in a Modular Organism: Phylogeny and Morphometry in the Cenozoic bryozoan *Adeonellopsis*" \$61,519 DEB-9006983 (1990-1993).

National Science Foundation: "Comparing Zooid and Colony Evolution in Modular Organisms: Arborescent Cheilostome Bryozoans" \$169,999 DEB-9306729 (1993-1996).

Olivier Rieppel

National Geographic Society: "Vertebrates of Triassic Coastal Environments from North America" \$7,790 NGS-4872-92 (1993)

National Science Foundation: "Phylogenetic Relationships of the Sauropterygia (Reptilia: Diapsida)" \$57,125 DEB-9220540 (1993-1994).

DEPARTMENT OF ZOOLOGY

Rüdiger Bieler

National Science Foundation: "Support for the computerization and expansion of the Invertebrate Collection" \$102,268 DEB-9216374 (1993-1994), (with J. Voight).

National Science Foundation: "Support for Minority Undergraduate Involvement in Collection Management in the Center for Evolutionary and Environmental Biology at FMNH" \$84,763 Supplement to DEB-9216374 (1993), (with J. Voight).

Smithsonian Marine Station: "Visiting Scientist Fellowship; travel and use of vessels and laboratory facilities" (1993 [four weeks]).

Barry Chernoff

National Science Foundation: "Support for Computerization and Expansion of Ichthyology Collection of the Field Museum of Natural History" \$352,846 BSR-9012652 (1991-1994).

Jack Fooden

National Science Foundation: "Support for the primate facility at Field Museum of Natural History" \$25,537 BNS-9204356 (1992-1994), (with B. Patterson and J. Haas).

Steven M. Goodman

National Geographic Society: "Biogeography of small mammals in the Eastern Arc Mountains, Tanzania" \$17,965 NGS-5053-93 (1993), (with W. Stanley).

John G. Hall

National Science Foundation: "Renovation of Biochemistry Laboratories and Instrumentation acquisition." \$151,356 STI-9214446 (1993-1995), (with S. Lanyon).

Lawrence R. Heaney

The John D. and Catherine T. MacArthur Foundation: "Conservation of Mammalian Diversity in the Philippines" \$295,000 90-9272A (1990-1993).

The John D. and Catherine T. MacArthur Foundation: "Collaborative Advanced Training in the Conservation of Biological Diversity" \$435,000 93-22387A (1993-1996).

Robert Inger

The John D. and Catherine T. MacArthur Foundation: Processes affecting variation of anuran communities in Bornean forests \$175,000 WER-GA90-9833 (1990-1993).

John Kethley

National Science Foundation: "Support for the Care and Use of Insects and Other Arthropods of the Field Museum of Natural History" \$710,047 DEB-8814449 (1989-1994), (with A. F. Newton).

Scott Lanyon

National Science Foundation: "Collection Computerization in the Division of Birds (Phase II)" \$386,726 DEB-9114760 (1992-1997), (with D. Willard and P. Lowther).

Institute of Museum Services: "Conservation projects in the fluid collections of the Department of Zoology" \$25,000 (1992-1993)

National Science Foundation: "Renovation of Biochemistry Laboratories and Instrumentation acquisition." \$151,356 STI-9214446 (1993-1995), (with J. Hall).

Peter E. Lowther

National Science Foundation: "Collection Computerization in the Division of Birds (Phase II)" DEB-9114760 (1992-1997) (with S. Lanyon and D. E. Willard).

Alfred Newton

National Science Foundation: "Support for the Care and Use of Insects and Other Arthropods of the Field Museum of Natural History" \$710,047 DEB-8814449 (1989-1994) (with J. Kethley).

National Science Foundation: "Revision of New World *Platydracus* species [190 species]" \$89,009 BSR-8906825 (1989-1993).

Bruce D. Patterson

National Science Foundation: "Support for the primate facility at Field Museum of Natural History" \$25,537 BNS-9204356 (1992-1994), (with J. Fooden and J. Haas).

A. Townsend Peterson

National Science Foundation: "Terrestrial vertebrate faunas of the humid montane forests of Oaxaca: an intensive biological survey and geographic analysis" \$169,341 DEB-9200863 (1992-1995).

Alan Resetar

National Science Foundation: "Support to enhance the accessibility of the herpetological collections of the Field Museum of Natural History" \$125,238 BSR-9024283 (1991-1995) (with H. K. Voris).

William Stanley

National Geographic Society: "Biogeography of small mammals in the Eastern Arc Mountains, Tanzania" \$17,965 NGS-5053-93 (1993) (with S. Goodman).

Janet Voight

National Science Foundation: "Phylogenetic Reevaluation of the Octopod Suborders" \$17,793 DEB-9306925 (1993-1994).

National Science Foundation: "Support for the computerization and expansion of the Invertebrate Collection" \$102,268 DEB-9216374 (1993-1994), (with R. Bieler).

National Science Foundation: "Support for Minority Undergraduate Involvement in Collection Management in the Center for Evolutionary and Environmental Biology at FMNH" \$84,763 Supplement to DEB-9216374 (1993), (with R. Bieler).

Harold K. Voris

National Science Foundation: "Support to enhance the accessibility of the herpetological collections of the Field Museum of Natural History" \$125,238 BSR-9024283 (1991-1995) (with A. Resetar).

David Willard

National Science Foundation: "Collection Computerization in the Division of Birds (Phase II)" \$386,726 DEB-9114760 (1992-1997), (with S. Lanyon and P. Lowther).

CEEB, MUSEUM AND PUBLIC SERVICE, 1993
(EDITORSHIPS, COMMITTEES ETC.)

(excluding ad hoc reviews, committee alternates)

DEPARTMENT OF BOTANY

Fred R. Barrie

Secretary, Special Committee on Lectotypification of the XVth International Botanical Congress, Yokohama; Editorial Committee, International Code of Botanical Nomenclature.

William Burger

Scientific Editor, Fieldiana; Field Museum Space Committee, Field Museum Exhibits Committee (Africa).

Michael Dillon

Chair, Field Museum Scientific Advisory Council; Member, CEEB Management Group; Member, Field Museum Research Advisory Council.

John Engel

Editorial Board, Flora North America; Chair, Department of Botany (to 1 Sept.); Supervisor, Scientific Illustrators; Chair, Field Museum Publications Committee; Member, Centennial "Images in Motion" project committee; CEEB representative to Kaffeeklatsch.

Thomas G. Lammers

Education Committee, Botanical Society of America; Standing Committee for Botany, Pacific Science Association; volume editor for the Flora of the Greater Antilles; Member, Field Museum Scholarship Committee; Field Museum Science Advisory Council; Field Museum Collections Advisory Council, 1993, Field Museum Spring Systematics Symposium organizing committee.

Gary L. Smith Merrill

Director, ABLS Moss Exchange; Editor, Aschisma, Great Plains region.

Gregory Mueller

Advisory Panel, Systematic Biology Program, National Science Foundation; Councilor for Systematics and Evolution, Mycological Society of America; Chair, Editorial Committee, McIlvainea and The Mycophile; Scientific Advisor, Illinois Mycological Association.

Christine Niezgoda

Member, Field Museum CEEB Management Group; Professional Staff Representative, Field Museum Science Advisory Council, Field Museum Collections Advisory Council, Field Museum IMS Survey Task Force; Field Museum Policy and Procedures Committee; President, Field Museum Collections and Research Professional Staff.

Qiuxin Wu

Member, Kaffeeklatsch.

DEPARTMENT OF GEOLOGY

John Bolt

Treasurer, Society of Vertebrate Paleontology; Member, Field Museum Scientific Advisory Council, Field Museum Space Committee.

Peter R. Crane

Editorial Board, International Journal of Plant Science; Editorial Board, Review of Palaeobotany and Palynology; Editorial Board, Plant Systematics and Evolution; Chair, Field Museum Research Advisory Council; Chair, Field Museum Collections Advisory Council.

John J. Flynn

Secretary, Society of Vertebrate Paleontology; Member, Field Museum CEEB Management Group; Co-Chair, Earth History and Global Change Committee, Systematics Agenda 2000; Chair, Collections Computerization Committee, Society of Vertebrate Paleontology; Member, Romer Prize Committee, Society of Vertebrate Paleontology.

Lance Grande

Editorial Board, Revista; Chair, Field Museum Scholarship Committee; Member, Field Museum Publications Committee; Collections Advisory Committee, Field Museum; Member Romer Prize Committee and Program Committee, Society of Vertebrate Paleontology.

Patrick S. Herendeen

Member, Field Museum CEEB Management Group.

Scott Lidgard

Governing Board, Biological Sciences Collegiate Division, University of Chicago; Teaching Coordinator for CEEB; Chair, Association of North American Paleontological Societies

Doris B. Nitecki

Assistant Editor, Paleontological Journal.

Matthew Nitecki

Co-Editor, Acta Paleontologica Polonica; Editor, Paleontological Journal

Clarita Nunez

Member, Field Museum IMS Conservation Survey Review Task Force.

Olivier Rieppel

Editorial Board, Zoological Journal of the Linnean Society; Journal of Vertebrate Paleontology; Member, Field Museum Scientific Advisory Council; Member, Field Museum Scholarship Committee.

DEPARTMENT OF ZOOLOGY

Rüdiger Bieler

Editor-in-Chief, Monographs of Marine Mollusca; Managing Editor, Nemouria, Occasional Papers of the Delaware Museum of Natural History; Scientific Editor, Smithsonian Institution Translations Publishing Program; Editorial Board Member, Malacologia-International Journal of Malacology, The Nautilus, Malacological Review; Coordinator for the 'Lower Heterobranch' gastropod section of Treatise on Invertebrate Paleontology; Secretary, Council of Systematic Malacologists; Vice-President, American Malacological Union; representative to UNITAS, also endowment and student award committees, American Malacological Union; Board of Directors, Delaware Museum of Natural History; Research Associate, Museum of Comparative Zoology, Harvard University; Member, Field Museum Science Advisory Council; Member, Field Museum Kaffeeklatsch; Scholarship Committee; Field Museum Noon Balloon Coordinator.

Barry Chernoff

Board of Governors, American Society of Ichthyologists and Herpetologists; Governing Council, Society of Systematic Biologists; Committee Member, U.S. National Committee for International Union of Biological Sciences, National Research Council; Editorial Board, Fishes of the Western North Atlantic; Member, Field Museum CEEB Management Group.

Jack Fooden

Consulting Editor, American Journal of Primatology; Editorial Board, International Journal of Primatology.

Lawrence R. Heaney

Chiropteran Advisory Group, American Association of Zoological Parks and Aquaria; Science Advisory Board, Lube Foundation; American Society of Mammalogists: Board of Directors, Conservation of Land Mammals Committee, Program Committee, Animal Care and Use Committee; Member, Field Museum Science Advisory Council; Member, Field Museum Research Advisory Council.

Robert Inger

Board of Trustees, Illinois Chapter, The Nature Conservancy.

Julian C. Kerbis Peterhans

Consultant, United States Fish and Wildlife Service; Program Co-Developer and Co-Coordinator, Minority Undergraduate Training Program at Field Museum.

John Kethley

Field Museum Affirmative Action Task Force, Field Museum Space Committee.

Scott Lanyon

Councilor, American Ornithologists' Union (1993-1996); Chair, Collections Committee, American Ornithologists' Union; Student Awards Committee, American Ornithologists' Union; Ornithology and the Law subcommittee, American Ornithologists' Union; FMNH representative to International Council on Bird Preservation; Nancy Reyerson Ranney Leadership Program Committee; Co-chair, Committee on Evolutionary Biology University of Chicago; Member, Field Museum CEEB Management Group; Member, Field Museum Animal Use Committee.

Peter E. Lowther

Editor, Inland Bird Banding Association for North American Bird Bander.

Alfred F. Newton

Councilor, Coleopterists Society (1993-4); Field Museum Publications Committee; Visiting Curator, Bishop Museum; Visiting Curator, California Academy of Sciences.

Bruce D. Patterson

Editor for reviews, Journal of Mammalogy; Editorial Board, Biodiversity Letters; Editorial Board, Mastozoologia Neotropical; Member, Field Museum Collections Advisory Council; Director, American Society of Mammalogists (ASM); Member, Merriam Award Committee, ASM; Member, Checklist Committee, ASM; New World Marsupial Specialists Group, IUCN/SSZ; Field Museum Botany Promotions and Review Committee.

A. Townsend Peterson

AOU representative, International Council on Bird Preservation.

Alan Resetar

Co-coordinator, Historical Trends Section, Declining Amphibian Population Task Force—Central Division; Member, Indiana Nongame Program, Amphibian and Reptile Technical Advisory Committee.

Mary Anne Rogers

Collection and Resource Committee, American Society of Ichthyologists and Herpetologists; Member, Field Museum Recycling/Environmental Awareness Committee; Member, Field Museum Research Advisory Council.

Thomas S. Schulenberg

Editorial Board, Bird Conservation International.

Petra Sierwald

Consultant, United States Fish and Wildlife Service; Chair, Student Papers Committee, American Arachnological Society.

John Slapcinsky

Chair, Field Museum United Way/Crusade of Mercy Campaign.

William Stanley

Vice President, Collections and Research Professional Staff; Professional Staff Representative, Field Museum Science Advisory Council; Member, Field Museum Recycling/Environmental Awareness Committee.

Daniel Summers

Member, Field Museum Collections Advisory Council; Member, Field Museum Personnel Committee.

Margaret K. Thayer

President-Elect, Coleopterists Society; Editorial Board, *Annals of the Entomological Society of America*; International Editorial Board, Annales Zoologici; Visiting Curator, California Academy of Sciences; Visiting Curator, Bishop Museum.

Janet Voight

Chair, Membership Committee of the American Malacological Union; Coordinator, Field Museum Evolutionary Biology Seminar Series.

Harold K. Voris

Scientific Editor, Fieldiana.

Mark Westneat

Coordinator, Field Museum Evolutionary Biology Seminar Series; Program Officer, Division of Vertebrate Morphology, American Society of Zoologists.

CEEB, SCIENTIFIC TRAVEL, 1993

DEPARTMENT OF BOTANY

Fred R. Barrie

London, England, research, Natural History Museum; Yokohama, Japan, International Botanical Congress

William Burger

New York, New York, Neotropical Montane Forest Symposium, New York Botanical Garden

Michael Dillon

Peru, Biodiversity & Development in Northern Peru; St. Louis, Missouri, Missouri Botanic Garden; New York, New York, Neotropical Montane Forest Symposium, New York Botanical Garden; Berkeley, California, SMASCH workshop, University of California at Berkeley

John Engel

St. Louis, Missouri, Flora North America Editorial Board meeting

Thomas G. Lammers

St. Louis, Missouri, Missouri Botanical Garden, "Tropicos" database system; Geographic Information System; Ames, Iowa, American Institute of Biological Sciences Annual Meeting; St. Louis, Missouri, Missouri Botanical Garden, Fall Systematics Symposium

Gary L. Smith Merrill

Ames, Iowa, American Bryological & Lichenological Society; NE Iowa, ABLS Foray; Southern Illinois, Midwest Bryological Foray; Ohio, Minnesota, fieldwork; New York State, research

Gregory Mueller

Costa Rica, fieldwork; Athens, Georgia, Mycological Society of America; New York, New York, Symposium on Neotropical Montane Forests—Biodiversity and Conservation, New York Botanical Garden

Christine Niezgoda

Marina del Rey, California, Preventative Care of Historic Photographs and Negatives, Getty Conservation Institute; St. Louis, Missouri, Fall, Systematics Symposium, Missouri Botanical Garden; Fort Worth, Texas, Sampling the Green World Symposium, Botanical Research Institute of Texas

Qiuxin Wu

Athens, Georgia, Mycological Society of America Annual Meeting

DEPARTMENT OF GEOLOGY

John R. Bolt

Albuquerque, Annual Meeting of the Society of Vertebrate Paleontology

Greg Buckley

Madagascar, fieldwork; Albuquerque, New Mexico, Annual Meeting of the Society for Vertebrate Paleontology.

Ignacio Casanova

Vail, Colorado, Annual Meeting of the Meteoritical Society; Houston, Texas, 24th Lunar and Planetary Science Conference; Houston, Texas, research, NASA

Peter R. Crane

Melbourne, Australia, collaborative research, University of Melbourne; Stockholm, Sweden, collaborative research, Swedish Museum of Natural History; Amman, Jordan, collaborative research, University of Amman; Boston, Massachusetts, Geological Society of America Annual Meeting; Ames, Iowa, American Institute of Botanical Sciences Annual Meeting; Taos, New Mexico, Evolution and Plant Development Keystone Symposium; Washington DC, Smithsonian Institution, Mellon Fellowship; Austin Texas, seminar, University of Texas; London, U.K., Evolution of the Monocotyledons Symposium, Royal Botanic Gardens, Kew; Tennessee, fieldwork; Georgia, fieldwork; Yokohama, Japan, International Botanical Congress; London, U.K., Evolution of the Arctic Biota and Climate NATO workshop, University of Northeast London; East Lansing, Michigan, MidContinent Paleobotanical Colloquium, Michigan State University; New Haven, Connecticut, seminar, Yale University; St. Louis, Missouri, Fall Systematics Symposium Missouri Botanical Garden; Reading, U.K., seminar, University of Reading

John J. Flynn

SW Wyoming and NW Montana, fieldwork; Chile, fieldwork; Albuquerque, New Mexico, Annual Meeting of the Society of Vertebrate Paleontology; New Orleans, Louisiana, American Association of Petroleum Geologists Meeting; Sydney, Australia, International Theriological Congress

Lance Grande

Eichstätt, Bavaria, fieldwork, research, seminar; Northern Italy, fieldwork; Albuquerque, New Mexico, Annual Meeting of the Society of Vertebrate Paleontology; Amherst, Massachusetts, student thesis defence.

Patrick Herendeen

Ames, Iowa, American Institute of Botanical Sciences Annual Meeting; London, U.K., Evolution of the Monocotyledons Symposium, Royal Botanic Gardens, Kew; England, fieldwork; Tennessee, fieldwork; Georgia, fieldwork; East Lansing, Michigan, MidContinent Paleobotanical Colloquium, Michigan State University; St. Louis, Missouri, Fall Systematics Symposium Missouri Botanical Garden

Sara Hoot

Ames, Iowa, American Institute of Botanical Sciences Annual Meeting; London, U.K., Evolution of the Monocotyledons Symposium, Royal Botanic Gardens, Kew; St. Louis, Missouri, Fall Systematics Symposium Missouri Botanical Garden

Scott Lidgard

Washington, DC, research, Smithsonian Institution; Boston, Massachusetts, Geological Society of America Meeting

Matthew H. Nitecki

Edmonton, Canada, Seminar, University of Alberta; Ann Arbor, Seminar, University of Michigan

Robert Masek

NW Montana and SW Montana, fieldwork

Steve McCarroll

NW Montana, fieldwork; SW Wyoming, fieldwork; Albuquerque, New Mexico, Annual Meeting of the Society of Vertebrate Paleontologists

Clarita M. Nunez

Springfield, Illinois, Conservation of Geological Specimens Seminar, Illinois State Museum Collections and Research Center; Victoria, British Columbia, Annual Meeting of the Society for the Preservation of Natural History Collections, Royal British Columbia Museum

Olivier Rieppel

Frankfurt, Germany, research; Gottingen, Germany, research; Marburg, Germany, research; Nevada, fieldwork; London, U.K., research; Berlin, Germany, research; Halle, Germany, research; Heidelberg, Germany, research; Ingelfingen, Germany, research; München, Germany, research; Solnhofen, Germany, research; Stuttgart, Germany, research; Tübingen, Germany, fieldwork

William F. Simpson

Chile, fieldwork, Field Museum expedition; Niger, Africa, fieldwork, University of Chicago Centennial Expedition

William Turnbull

Washakie Basin, southwest Wyoming, fieldwork.

DEPARTMENT OF ZOOLOGY**Thomas Anton**

Austin, Texas, American Society of Ichthyologists and Herpetologists Annual Meetings; Jackson County, Illinois, fieldwork; Bloomington, Indiana, Society for the Study of Amphibians and Reptiles Meetings; Steelville, Missouri, Declining Amphibian Population Task Force—Midwest Region Committee

Rüdiger Bieler

Ft. Pierce, Florida, fieldwork, Smithsonian Marine Station/Harbor Branch Oceanographic Institution; Bahamas, American Malacological Union meeting; NW coast of Florida and Gulf of Mexico, fieldwork; various east coast museums, research

Barry Chernoff

Durham, North Carolina, research, Duke University; Washington, D.C., National Committee for International Union of Biological Sciences Meetings, National Academy of Sciences; Chicago, Illinois, Spring Systematic Symposium, Field Museum; Austin, Texas, American Society of Ichthyologists and Herpetologists Annual Meetings; Snowbird, Utah, Society for the Study of Evolution/Society of Systematic Biologists Annual Meetings; Rio Caura & Angel Falls, fieldwork and CEEB video project; Washington, D.C., National Committee for International Union of Biological Sciences Meetings, National Academy of Sciences

Brian Dyer

Austin, Texas, American Society of Ichthyologists and Herpetologists Annual Meetings

Jack Fooden

Cambridge, Massachusetts, research, Museum of Comparative Zoology

Thomas Gnoske

Oaxaca, Mexico field work

Steven M. Goodman

Madagascar, fieldwork and teaching; Tanzania, fieldwork; Kansas, research, University of Kansas; Ann Arbor, Michigan, research, University of Michigan

Lawrence R. Heaney

Philippines, fieldwork and training; Bellingham, Washington, American Society of Mammalogists meeting; Sydney, Australia, International Theriological Congress; Arizona, seminar, Arizona State University; Utah, research, University of Utah

Robert Inger

Malaysia, research and fieldwork

Julian C. Kerbis Peterhans

Cambridge, Massachusetts, research, Museum of Comparative Zoology

John Kethley

Indianapolis, Indiana, Joint ASA/ESA meetings

Scott Lanyon

Fairbanks, Alaska, American Ornithologists' Union Meeting

Peter E. Lowther

NW Iowa, Iowa Lakeside Laboratory; Paradise, Michigan, Inland Bird Banding Association

Harry G. Nelson

Eastern North America, fieldwork

Alfred F. Newton

Tasmania and southeastern Australia, fieldwork; California, fieldwork; Hawaii, research, Bishop Museum; California, research, California Academy of Sciences; Hobart, Australia, Southern Temperate Ecosystems conference; Lafayette, Indiana, Entomology Collections Network annual meeting; Indianapolis Indiana, Entomological Society of America annual meeting; Hobart, Australia, research, Department of Primary Industry; Canberra, Australia, research, Australian National Insect Collection; Purdue, Indiana, research, Purdue University

Philip Parrillo

Bolivia, fieldwork.

Bruce D. Patterson

Sao Paulo, Brazil, fieldwork; Bellingham, Washington, American Society of Mammalogists meeting; Sydney, Australia, International Theriological Congress; Lawrence, Kansas, seminars, Ecology and Systematics Department, Museum of Natural History

A. Townsend Peterson

Oaxaca, Mexico, fieldwork.

Alan Resetar

Bloomington, Indiana, Society for the Study of Amphibians and Reptiles; Steelville, Missouri, Declining Amphibian Population Task Force-Central Division meeting, Reis Biological Station; Indianapolis, Indiana, Indiana Nongame Program Amphibian and Reptile Technical Advisory Committee meeting; West Lafayette, Indiana, Indiana Academy of Sciences.

Mary Anne Rogers

Austin, Texas, American Society of Ichthyologists and Herpetologists Annual Meetings; Bellingham, Washington, American Society of Mammalogists Annual Meetings

Thomas S. Schulenberg

Fairbanks, Alaska, American ornithologists' Union Meeting

Jodi Sedlock

Oaxaca, Mexico, fieldwork

Petra Siewald

Seattle, Washington, Annual Meeting of the American Arachnological Society

John Slapcinsky

Victoria, Canada, Society for the Preservation of Natural History Collections meeting

William T. Stanley

Bellingham, Washington, American Society of Mammalogists meeting; London, UK, research; Tanzania, fieldwork

Daniel Summers

Indianapolis, Indiana, Entomological Society of America Annual Meeting.

Margaret K. Thayer

Tasmania and southeastern Australia, fieldwork; California, fieldwork; Hawaii, research, Bishop Museum; California, research, California Academy of Sciences; Hobart, Australia, Southern Temperate Ecosystems conference; Lafayette, Indiana, Entomology Collections Network annual meeting; Indianapolis Indiana, Entomological Society of America annual meeting; Hobart, Australia, research, Department of Primary Industry; Canberra, Australia, research, Australian National Insect Collection

Janet Voight

Cambridge, England, International Symposium on Southern Ocean Cephalopods; Bahamas, American Malacological Union meeting; Seattle, Washington, collaborative research, University of Washington; Miami, Florida, research, University of Miami Marine Laboratories; Seattle, Washington, research, Burke Museum; Vancouver, Canada, research, University of British Columbia; London, U.K., research, The Natural History Museum

Harold Voris

Malaysia, research and fieldwork; Bloomington, Indiana, Society for the Study of Amphibians and Reptiles; Adelaide, Australia, Second World Congress of Herpetology

Mark Westneat

Australian Great Barrier Reef and Coral Sea, fieldwork and collaborative research; Austin, Texas, American Society of Ichthyologists and Herpetologists Annual Meetings; Jackson County, Illinois, fieldwork; Snowbird, Utah, Society for the Study of Evolution/Society of Systematic Biologists Annual Meetings; Kailua-Kona, Hawaii, research, Pacific Ocean Research Foundation

David Willard

Fairbanks Alaska, American Ornithologists' Union Meeting
Oaxaca, Mexico field work

CEEB, CONTRIBUTIONS TO PUBLIC LEARNING, I, 1993
(EXHIBITS, INFORMAL EDUCATION, SEMINARS, ETC.)

DEPARTMENT OF BOTANY

William Burger

Exhibit Development: Content specialist, Africa Exhibit.

Education Programs: Elder Hostel Program, Giants of the Earth, Members' Night.

Seminars and Other Presentations: At the Field, Members' Lecture Series.

Michael Dillon

Education Programs: Giants of the Earth.

Seminars and Other Presentations: Into the Wilderness series for Women's Board; Presentation to Pan American Seed Company; Lecture series for Ohio State University.

Tours, etc.: Tours for New Explorer's Series.

John Engel

Exhibit Development: Co-Developer, Where Science and Education Meet: Finding Cures for AIDS from Plants; Co-Developer, "La Selva Fria" exhibit; Point Person, Drugs and Medicinal Plants.

Education Programs: Giants of the Earth; Members' Night.

Nancy Hensold

Education Programs: Members' Night, ID Day

Seminars and Other Presentations: Kenwood High School Science Club.

Marian Kadushin

Exhibit Development: Where Science and Education Meet: Finding Cures for AIDS from Plants

Thomas G. Lammers

Exhibit Development: Content specialist, Life over Time exhibit; Content specialist, renovation of Travelling the Pacific.

Education Programs: Members' Night; Giants of the Earth.

Seminars and Other Presentations: Friends of Library; Donors Group; Elder Hostel Program; Members' Lecture Series.

Tours, etc.: Founders' Council; University of Illinois at Chicago Biology Colloquium; Cameron's Publications; Pan American Seed Co.; Cub Scout den.

Gary L. Smith Merrill

Education Programs: Giants of the Earth; Members' Night.

Gregory Mueller

Education Programs: Members' Night; Giants of the Earth.

Seminars and Other Presentations: Field Museum Women's Board; La Selva Fria Exhibit lecture series; Illinois Mycological Association; Sand Ridge Chapter of Audubon Society; Fort Dearbon Chapter of Audubon Society; Organization for Tropical Studies (OTS), Las Cruces Biological Station, San Vito de Java, Costa Rica; Rush Presbyterian-St. Luke's Medical Center; University of Illinois at Chicago.

Tours, etc.: Field Museum Tour to Greek Islands.

Christine Niezgoda

Education Programs: Giants of the Earth

Seminars and Other Presentations: Botanical Research Institute of Texas, Fort Worth, TX.

Tours, etc.: Several College-level Botany classes.

Jodi Slapcinsky

Education Programs: Members' Night; Chicago Botanic Gardens.

Qiuxin Wu

Education Programs: Giants of the Earth; Members' Night.

DEPARTMENT OF GEOLOGY

John R. Bolt

Exhibit Development: Content specialist, Antarctic Dinosaurs, Life Over Time, Brachiosaurus.

Education Programs: Members' Night.

Seminars and Other Presentations: Augustana College; Society of Vertebrate Paleontology Annual Meeting, Albuquerque, New Mexico.

Greg Buckley

Exhibit Development: CEEB exhibit; Life Over Time; Animal Kingdom.

Education Programs: Members' Night; Giants of the Earth.

Seminars and Other Presentations: Society of Vertebrate Paleontology Annual Meeting, Albuquerque, New Mexico.

Ignacio Casanova

Education Programs: Field Museum Latin American Celebración; Members' Night.

Seminars and Other Presentations: Field Museum public lecture; volunteer group for Field Museum centennial celebration tours; Field Museum Education Department students; Seminar at the Adler Planetarium.

Tours, etc.: Chicago HMO group; Saudi Arabian group; other interested groups.

Peter R. Crane

Exhibit Development: Images in Motion, CEEB Elephant Rail, Antarctic Dinosaurs, Life Over Time, Centennial Video.

Education Programs: Members' Night; Giants of the Earth.

Seminars and Other Presentations: The Science Behind Jurassic Park Lectures; Field Museum Women's Board; Chicago Plant Sciences Seminar; University of Reading, U.K., Yale University, New Haven; Evolution of the Arctic Biota and Climate, London; International Botanical Congress, Japan; International Symposium on the Evolution of the Monocotyledons, Royal Botanic Gardens, Kew; University of Texas, Austin; Smithsonian Institution, Washington, DC; Keystone Symposium on Evolution and Plant Development, Taos; American Institute of Biological Sciences, Iowa State University; University of Amman, Jordan.

John J. Flynn

Exhibit Development: Content specialist, Life Over Time, Animal Kingdom, Africa, La Selva Fria, Brachiosaurus; Images in Motion consultant.

Education Programs: Members' Night; Giants of the Earth; ID Day; Brachiosaurus Hard Hat Party; New Explorer's Teacher's Inservice.

Seminars and Other Presentations: La Selva Fria Lecture Series; The Science Behind Jurassic Park Lectures; PBS show "Innovation: the Next Generation"; Society of Vertebrate Paleontology Annual Meeting, Albuquerque, New Mexico; International Theriological Congress, Sydney, Australia; American Association of Petroleum Geologists/Society of Sedimentary Geology Annual Meeting, New Orleans, Louisiana.

Lance Grande

Exhibit Development: Content specialist, Life Over Time.

Education Programs: Elder Hostel Program; Giants of the Earth; Members' Night.

Seminars and Other Presentations: Jura-Museum, Eichstätt, Germany; Society of Vertebrate Paleontology, New Mexico; University of Illinois at Chicago.

Patrick Herendeen

Education Programs: Giants of the Earth; Members' Night.

Sara Hoot

Seminars and Other Presentations: American Institute of Botanical Sciences Annual Meeting, Ames, Iowa.

Andrew Leman

Education Programs: Members' Night, Giants of the Earth.

Tours, etc.: Elder Hostel Program; Hubbard High School.

Scott Lidgard

Exhibit Development: Content specialist, Life Over Time; Animal Kingdom.

Education Programs: ID Day, Members' Night.

Robert Masek

Exhibit Development: Earliest Dinosaurs; Life Over Time; Brachiosaurus.

Education Programs: Members' Night; Giants of the Earth

Tours, etc.: Elderhostel Program; Behind the Scenes.

Steve McCarroll

Education Programs: Members' Night; Giants of the Earth.

Tours, etc.: Elder Hostel Program; Education Overnight; Behind-the-scenes.

Matthew H. Nitecki

Exhibit Development: Content specialist, Life Over Time

Education Programs: Members' Night

Seminars and Other Presentations: University of Alberta, Edmonton; University of Michigan, Ann Arbor; Lake Michigan Federation.

Clarita M. Nuñez

Education Programs: Members' Night, Giants of the Earth.

Seminars and other Presentations: Poster Presentation, Annual Meeting of the Society for the Preservation of Natural History Collections.

Tours, etc.: Chicago Art Institute students; Field Museum Centennial Celebration Education volunteers.

Olivier Rieppel

Exhibit Development: Content specialist, Life Over Time.

Education Programs: Friends of the Library; Members' Night; Giants of the Earth.

William F. Simpson

Exhibit Development: Earliest Dinosaurs; Life Over Time; Brachiosaurus.

Education Programs: Members' Night; ID Day; Giants of the Earth.

Tours, etc.: Fragments of Time Teacher's Inservice; Field Museum Board of Trustees; Earth Science Club of Illinois; PBS Film Crew; University of Illinois students; Interlochen High School students; Exploratorium group; 7th grade student group.

DEPARTMENT OF ZOOLOGY

Thomas Anton

Exhibit Development: Animal Kingdom.

Education Programs: Members' Night.

Margaret Baker

Education Programs: Giants of the Earth.

Rüdiger Bieler

Exhibit Development: Content specialist, Africa; Content specialist, Animal Kingdom III; Content specialist, Life Over Time.

Education Programs: Members' Night.

Seminars and Other Presentations: American Malacological Union, Bahamas; Conchologists of America, Panama City Beach, Florida; education program for minority student interns at FMNH; Centennial Tour Guide training; Field Museum's Founders Council.

Barry Chernoff

Exhibit Development: Content specialist, Animal Kingdom; Content specialist, Africa; Content specialist, Life Over Time.

Education Programs: Giants of the Earth.

Seminars and Other Presentations: Duke University, Department of Zoology; Evolutionary Morphology, University of Chicago; American Society of Ichthyologists and Herpetologists, Austin, Texas; Society for the Study of Evolution, Snowbird, Utah; Field Museum's Women's Board.

John G. Hall

Education Programs: Members' Night

Lawrence R. Heaney

Exhibit Development: Content specialist, Animal Kingdom; Life Over Time.

Education Programs: Collaborative Advanced Training Program in the Conservation of Biological Diversity; Members' Night.

Seminars and Other Presentations: Co-convenor, "Symposium on the Conservation of Vertebrate Diversity in the Philippines;" Arizona State University; University of Illinois-Chicago; Xavier University, Philippines; Iligan Institute of Technology, Philippines.

Robert Inger

Exhibit Development: Content Specialist, Animal Kingdom.

Seminars and Other Presentations: Friends of the Museum Lecture.

Julian C. Kerbis Peterhans

Education Programs: Members' Night.

Seminars and Other Presentations: Biology Colloquium, University of Illinois at Chicago; American Society of Mammalogists, Bellingham, Washington.

Tours, etc.: Field Museum Tour, Tanzania; Saddle & Cycle Club; Girl Scouts.

John Kethley

Seminars and Other Presentations: University of Chicago.

Scott Lanyon

Exhibit Development: Content specialist, Animal Kingdom; Images in Motion.

Education Programs: Jurassic Park: Fact or Fiction.

Seminars and Other Presentations: University of Illinois at Chicago; University of Minnesota; American Ornithologists' Union; Field Museum's Women's Board; University of Illinois at Chicago Biology Colloquium; Miami University's Scholar Leaders Tour.

Harry G. Nelson

Education Programs: Members' Night.

Alfred F. Newton

Exhibit Development: Content specialist, Life Over Time; Content specialist, La Selva Fria.

Seminars and Other Presentations: Southern Temperate Ecosystems conference, Hobart Tasmania.

Philip Parrillo

Exhibit Development: Images in Motion.

Education Programs: Members' Night, Giants of the Earth, Education Department, "Insects in Motion" Field Museum Education family class, Behind the Scenes.

Bruce D. Patterson

Exhibit Development: Content specialist, Animal Kingdom III; Content specialist, Africa; Content specialist, Life Over Time; Content specialist and Coordinator, La Selva Fria.

Education Programs: "Running Out of Time" (teacher's curriculum guide); Giants of the Earth.

Seminars and Other Presentations: Organizer, La Selva Fria public lecture series; 1993 Spring Systematics Symposium; Teacher's workshop on tropical deforestation; American Society of Mammalogists' Meeting, Sydney, Australia.

Alan Resetar

Exhibit Development: Animal Kingdom; Life Over Time; Consultant, Images in Motion; Consultant, Skulls.

Education Programs: Giants of the Earth; Behind-the-Scenes Tours of Division of Amphibians and Reptiles; Elder Hostel tour.

Seminars and Other Presentations: Lecture, Chesterton, Indiana Chapter of the Izaak Walton League; Lecture, National Park Service lecture series; Seminar, Declining Amphibian Population Task Force-Central Division meeting; Judge, Porter County, Indiana 4-H Fair Herpetology competitions.

Tours: University of Illinois at Chicago Biology Colloquium.

Mary Anne Rogers

Exhibit Development: Animal Kingdom; Life Over Time.

Education Programs: Giants of the Earth, Members' Night.

Seminars and Other Presentations: Green Fair presentation, Oakbrook, Illinois.

Petra Sierwald

Exhibit Development: Content specialist, Animal Kingdom.

Education Programs: Members' Night; Giants of the Earth.

Seminars and Other Presentations: Overnight workshop.

Tours, etc.: Behind-the-scenes.

John Slapcinsky

Exhibit Development: Animal Kingdom III; Life Over Time.

Education Programs: Members' Night; Giants of the Earth; Behind the Scenes; Family and Group Overnights; Earth Day Celebration.

Seminars and Other Presentations: Field Museum summer intern education program; Chicago Shell Club.

Tours, etc.: Museology Class, Chicago Shell Club.

William T. Stanley

Exhibit Development: Animal Kingdom; Africa.

Education Programs: Giants of the Earth; Greenfair, Oakbrook; Members' Night.

Seminars and Other Presentations: American Society of Mammalogists, Washington; Field Museum Friends of the Library Lecture; Family Workshop, Field Museum Education Department; Marine Mammals, Western Illinois University.

Daniel Summers

Exhibit Development: Animal Kingdom; Africa; Life Over Time.

Education Programs: Members' Night, Giants of the Earth.

Kevin Swagel

Exhibit Development: Animal Kingdom.

Education Programs: Members' Night.

Margaret K. Thayer

Exhibit Development: Content specialist, La Selva Fria; Content specialist, Animal Kingdom

Education Programs: Members' Night.

Seminars and Other Presentations: Entomological Collections Network, West Lafayette, Indiana; Southern Temperate Ecosystems conference, Hobart, Australia; Field Museum summer intern education program.

Janet Voight

Exhibit Development: Content specialist, Animal Kingdom III; Consultant, Centennial exhibits; Content specialist, Life Over Time.

Education Programs: Giants of the Earth, Members' Night.

Seminars and Other Presentations: International Symposium on Southern Ocean Cephalopods, Cambridge, England; American Malacological Union, Bahamas; Central Missouri State University, Warrensburg, Missouri; 'At the Field' members lecture; Biodiversity course, University of Chicago; Field Ecology class, University of Chicago; Museology high school course, Field Museum.

Tours: Field Museum tour to Queen Charlotte Islands.

Harold K. Voris

Exhibit Development: Content specialist, Animal Kingdom.

Seminars and Other Presentations: SSAR meeting, Bloomington, Indiana; Second World Congress of Herpetology, Adelaide, Australia.

Tours, etc.: Field Museum tour, Belize/Tikal/Barrier Reef.

Mark Westneat

Exhibit Development: Content specialist, Animal Kingdom.

Education Programs: Giants of the Earth, Members' Night.

Seminars and Other Presentations: American Society of Ichthyologists and Herpetologists, Austin, TX; Society for the Study of Evolution, Snowbird, UT; Lecture, Elder Hostel program; Lecture, University of Chicago Human Morphology course.

David Willard

Exhibit Development: Animal Kingdom, Life Over Time.

Education Programs: Teachers Overnight; Museology; New Explorers Workshop; Collections Tours; Women's Board Tour; Elder Hostel; Art Institute of Chicago; Members' Night.

Seminars and Other Presentations: Chicago Audubon Society; Dupage Bird Club; St. Mary's College; University of Illinois at Chicago Biology Colloquium; Ryerson Smith Symposium Workshop; Fort Dearborn Audubon Society; Hang Gliding Association; Field Museum tour program, Galapagos Islands; Spring Green Wisconsin; Field Museum Tour program, Zimbabwe/Botswana.

CEEB, CONTRIBUTIONS TO PUBLIC LEARNING, II, 1993
(UNIVERSITY/HIGH SCHOOL EDUCATION)

DEPARTMENT OF BOTANY

William Burger

Courses: Lecturer on Ethiopia, Kenwood Academy High School.

Michael O. Dillon

Interns: Todd Vision, University of Chicago.

Thomas G. Lammers

Course: Theory and Practice of Botanical Systematics, University of Illinois at Chicago.

Gregory M. Mueller

Graduate Students Advised: T. W. May, Monash University, Australia.

Interns: Elizabeth Pine, Illinois Mathematics and Science Academy; Marlin Khouri, University of Illinois at Chicago.

Christine Niezgoda

Interns and Work/Study: Cristina Ugarte, University of New Mexico.

Qiuxin Wu

Interns: Sarah Long, DePaul University; Michelle Pruyn, University of Chicago; Marlin Khouri, University of Illinois at Chicago.

DEPARTMENT OF GEOLOGY

John R. Bolt

Courses: Lecturer, Vertebrate Paleontology, University of Chicago; Lecturer, Topics in Paleobiology, University of Chicago.

Graduate Students Advised: Chao Yu, University of Chicago.

Greg Buckley

Interns and Work/Study: Kathleen Horaszy, Smith College; Joanne Sison, Johns Hopkins University.

Ignacio Casanova

Courses: Meteorites and the Origin of the Earth, Adult Education Course, Field Museum; Meteorites and the Early Solar System, Adult Education Course, Adler Planetarium.

Peter R. Crane

Course: Plant Paleontology, University of Chicago.

Graduate Students Advised: Jane Masterson, University of Chicago; Rick Lupia, University of Chicago; Paul Markwick, University of Chicago.

Interns: Hallie Sims, Wellesley College.

Post-Doctoral Associates: Sara Hoot; Patrick Herendeen.

John J. Flynn

Courses: Systematics Reading Course, University of Chicago/University of Illinois at Chicago; Mammalian Evolution, University of Chicago; Diversity of Life Through Time, University of Chicago; Independent Study, University of Illinois at Chicago.

Graduate Students Advised: Greg Buckley, Rutgers University; Javier Guerrero, Duke University; William Stevens, University of Chicago; Pamela Austin, University of Illinois at Chicago; Tim Gaudin, University of Chicago; John Alroy, University of Chicago; Doreen Covey, University of Illinois at Chicago.

Interns and Work/Study: Mary Wisz, University of Illinois at Chicago; Johanna Lombard, University of Chicago.

Lance Grande

Course: Biohistory: Ontogeny, Phylogeny & Paleontology, University of Illinois at Chicago.

Graduate Students Advised: Christopher Fielitz, University of Illinois at Chicago.

Intern: Kathy Domovic.

Patrick S. Herendeen

Intern: Katherine Kexin Zhao, Kenwood High School.

Sara Hoot

Intern: Alafia Thurmond, Harold Washington.

Scott Lidgard

Course: Diversity of Life Through Time, University of Chicago.

Graduate Student Advised: Paul Markwick, University of Chicago; Richard Lupia, University of Chicago.

Interns and Work/Study: Kathleen Horaszy, Smith College; Joanne Sison.

Matthew H. Nitecki

Course: Introduction to Evolutionary Biology, University of Chicago.

Clarita M. Nunez

Interns and Work/Study: Tsz Woon Yeung, Kelly High School.

Olivier M. Rieppel

Course: Evolutionary Morphology of Vertebrates, Northwestern University.

William F. Simpson

Interns and Work/Study: Kathryn Domovic, University of Illinois at Chicago; Joanna Lombard, University of Chicago.

DEPARTMENT OF ZOOLOGY

Rüdiger Bieler

Course: Biology of the Mollusca, University of Chicago.

Graduate Students Advised: Jay Schneider, University of Chicago; Peter Wagner, University of Chicago; Paula M. Mikkelsen, Florida Institute of Technology.

Interns: Rebecca Mentzer, Susan Slominski.

Barry Chernoff

Courses: Systematic Biology, University of Chicago; Advanced Systematic Biology, University of Chicago; Independent Studies in Evolution, University of Chicago.

Graduate Students Advised: Doreen Covey, University of Illinois at Chicago; Kate Kelley, University of Chicago; Thomas Schulenberg, University of Chicago; Scott Steppan, University of Chicago; John Harshman, University of Chicago; Allison Able, University of Chicago; Bill Stevens, University of Chicago; Brian Dyer, University of Michigan; Holanda Merced, Universidad Central de Venezuela; Nadia Romierez, Universidad Central de Venezuela; Joe Walsh, University of Chicago.

Jack Fooden

Graduate Students Advised: Yining Luo, Michigan State University.

Lawrence R. Heaney

Course: Independent Studies in Evolution, University of Chicago

Graduate Students Advised: Danilo Balete, University of Illinois at Chicago; Shukor MdNor, University of Illinois at Chicago; Ruth Uzzurum, Boston University; Joseph Walsh, University of Chicago; Link Olson, University of Chicago; Thomas S. Schulenberg, University of Chicago.

Interns and Work/Study: Andres Dans and Leticia Espiritu-Afuang, University of the Philippines at Los Banos; Renee Pa-alan, Silliman University, Philippines; Jodi Sedlock, Loyola University of Chicago; Blas Tabaranza, Mindanao State University; Jamie Welling, Western Illinois University.

Robert F. Inger

Graduate Student Advised: Nancy Reagan, University of Chicago.

Julian C. Kerbis Peterhans

Graduate Students Advised: Kathleen Blue, University of Chicago; Melinda Carter, University of Chicago; Charles Musiba, University of Chicago; James Pokines, University of Chicago.

Interns and Work/Study: Jason Black, Chicago State University; Yolanda Goodloe, Chicago State University; Roger Spencer, Chicago State University.

John Kethley:

Courses: Agricultural Acarology and Medical and Veterinary Acarology, Summer Institute of Acarology, Ohio State University.

Graduate Students Advised: John Harshman, University of Chicago; Alan Molumby, University of Chicago.

Scott M. Lanyon

Course: Independent Studies in Evolution, University of Chicago.

Graduate Students Advised: John Harshman, University of Chicago; Thomas Schulenberg, University of Chicago; Kevin Dixon, University of Chicago; Jack Dumbacher, University of Chicago; Krista Lee, University of Illinois at Chicago; Shaibal Mitra, University of Chicago; Robert A. Morgan, University of Illinois at Chicago; Jonathan Regosin, University of Chicago; Joe Walsh, University of Chicago; Kevina Vulinec, University of Chicago; Robb Brumfield, Illinois State University; Keith Barker, University of Chicago; Katherine Kelley, University of Chicago.

Melissa Morales

Interns: Claire Cornelius, Yvonne Silva, Jamie Welling.

Philip Parrillo

Course: Insect Evolution, Field Museum Education Department.

Intern: Michael Allison.

Graduate Students Advised: Wilson Rojas, Universidad Autónoma "Gabriel René Moreno."

Bruce D. Patterson

Courses: Biogeography, University of Chicago; Independent Studies in Evolution, University of Chicago.

Graduate Students Advised: Nigel Asquith, University of Illinois at Chicago; Pamela Austin, University of Illinois at Chicago; Doreen Covey, University of Illinois at Chicago; Diane Jedlicka, University of Illinois at Chicago; Janis Kohler, University of Chicago; Jane Norman, University of Illinois at Chicago; Link Olson, University of Chicago; Scott Steppan, University of Chicago; Virginia Turner-Erfort, University of Illinois at Chicago; Chris Yahnke, Northern Illinois University; John Yunger, Northern Illinois University.

Alan Resetar

Interns and Work/Study: Michael Sleet.

Mary Anne Rogers

Interns and Work/Study: Amy Hartwick, University of Michigan; Bechy Giorno, Eureka College.

Petra Sierwald

Course: Introduction to Evolutionary Biology, University of Chicago.

John Slapcinsky

Interns and Work/Study: Gide Colinet, Becky Giorno, Tonya Harris, Amy Hartwig, Jennifer Hummel, A'vila Terrell Jackson, Rebecca Mentzer, Susan Slominski, Shillock Yuan.

Daniel Summers

Interns: Marisa Perkins, Michael Allison.

Janet Voight

Interns: Gide Colinet, Tonya Harris, Jennifer Hummel, A'vila Terrell Jackson, Rebecca Mentzer, Susan Slominski.

Harold Voris

Interns and Work/Study: Maria Bucio, Lisa Mills, Ramiro Nava.

Mark W. Westneat

Course: Human Morphology, University of Chicago Medical School.

Graduate Students Advised: John Finnerty, University of Chicago, Melina Hale, University of Chicago; Laura Pauko, University of Chicago.

Interns and Work/Study: William Browne, University of Chicago; Joe Anderson, Northwestern University.

CEEB, UNDERGRADUATE INTERNS, 1993

National Science Foundation Interns

Michael Allison, Harold Washington College (Insects); Gide Colinet, Olive-Harvey College (Invertebrates); Kathy Domovic, University of Illinois at Chicago (Vertebrate Paleontology); Rebecca Giorno, Eureka College (Zoology); Yolanda Goodloe, Chicago State University (Mammals); Katie Harazy, Smith College (Invertebrate Paleontology); Tonya Harris, Chicago State University (Invertebrates); Amy Hartwick, University of Michigan (Zoology); Jennifer Hummel, Eastern Illinois University (Invertebrates); A'vila Terrell Jackson, Harold Washington College (Invertebrates); Johanna Lombard, University of Chicago (Vertebrate Paleontology); Sarah Long, DePaul University (Botany); Rebecca Mentzer, Valparaiso University (Invertebrates); Marisa Perkins, Chicago State University (Insects); Michelle Pruyn, University of Chicago (Botany); Yvonne Silva, University of Illinois, Champaign-Urbana (Mammals); Jo Ann Sison, Illinois Math and Science Academy (Invertebrate Paleontology); Michael Sleet, Whitney Young High School (Amphibians and Reptiles); Susan Slominski, Truman College (Invertebrates); Twe Woon Yeung, Kelly High School (Meteoritics).

Field Museum Scholarship Program Interns

Roarke Donnelly, Lawrence College (Birds); Ian Gordon, University of Chicago (Anthropology); Elizabeth Pine, Illinois Math and Science Academy (Botany); Todd Vision, University of Chicago (Botany); Jamie Welling, Western Illinois University (Mammals); Mary Wisz, University of Illinois at Chicago (Vertebrate Paleontology)

CEEB Interns

William Brown, University of Chicago (Fishes); Claire Cornelius, Kenwood High School (Mammals); Alexandra Gnoske, Colorado State University (Birds); Jodi Sedlock, Loyola University (Birds); Christina Ugarte, University of New Mexico (Botany); Katherine Zhao, Kenwood High School (Paleobotany)

NSF Supplement for High School Teacher and Interns

Mario Bucio, Benito Juarez High School (Amphibians and Reptiles); John Murphy, Plainfield High School (Amphibians and Reptiles); Ramiro Nava, Benito Juarez High School (Amphibians and Reptiles)

Other Interns

Kathrin Dietze, University of Massachusetts (Vertebrate Paleontology); Nancy Ruddock, University of Massachusetts (Vertebrate Paleontology)

CEEB, RESIDENT STUDENTS, 1993

P. Austin, University of Illinois at Chicago (Zoology); D. Balet, University of Illinois at Chicago (Zoology); K. Barker, University of Chicago (Zoology); W. Browne, University of Chicago (Zoology); B. Dyer, University of Michigan (Zoology); T. Gaudin, University of Chicago (Geology); B. Harney, University of Arizona (Zoology); M. Hale, University of Chicago (Zoology); J. Harshman, University of Chicago (Zoology); M. Kadushin, University of Illinois at Chicago; K. Kelley, University of Chicago (Zoology); J. Kohler, University of Chicago (Zoology); S. MdNor, University of Illinois at Chicago (Zoology); D. Miller, University of Chicago (Geology); L. Olson, University of Chicago (Zoology); T. Schulenberg, University of Chicago (Zoology); S. Steppan, University of Chicago (Zoology); W. Stevens, University of Chicago (Geology); V. Turner-Erfort, University of Illinois at Chicago (Zoology); J. Walsh, University of Chicago (Zoology).

CEEB, VOLUNTEERS, 1993

DEPARTMENT OF BOTANY

Helen Beiser, Mycology; Elizabeth Farwell, Mycology; Dietrich Haas, Mycology; Alfonso Lacayo, Phanerogams; Lillie Mannings, Economic Botany; Margaret Martling, Phanerogams; Sel Mather, Type Photographs; Sam Mayo, Pteridophytes; Albert Miller, Bryophytes; Alice Piller, Mycology; Martha Singer, Mycology; Dan Snyder, Phanerogams; Julius Wagman, Cryptogams

DEPARTMENT OF GEOLOGY

Barbara Ballard, Invertebrate Paleontology; Carol Braun, Vertebrate Paleontology; Paul Brinkman, Vertebrate Paleontology; Irene Broede, Vertebrate Paleontology; David Ciske, Vertebrate Paleontology; Mary Coates, Invertebrate Paleontology; Wendy Colter, Vertebrate Paleontology; John deMichele, Vertebrate Paleontology; Michael Henderson, Paleobotany; Debra Hettinger, Mineralogy; Asif Khan, Vertebrate Paleontology; Walter Laffer, Meteoritics; Austin Leal, Meteoritics; John McConnell, Invertebrate Paleontology; Donald Newton, Vertebrate Paleontology; Joan Slotnick, Meteoritics; Brad Wright, Vertebrate Paleontology

DEPARTMENT OF ZOOLOGY

Joe Anderson, Fishes; Tom Anton, Amphibians and Reptiles; Michelle Brown, Amphibians and Reptiles; Robert Brunner, Amphibians and Reptiles; Robert Brunner, Fishes; Sophie Brunner, Amphibians and Reptiles; Renee Buecker, Insects; Chris Calandra, Amphibians and Reptiles; Sidney Camras, Insects; John Cullen, Insects; Randall DeBouvre, Invertebrates; Ryan Duty, Mammals; Stanley Dvorak, Invertebrates; M. Alison Ebert, Mammals; Ingrid Fauci, Amphibians and Reptiles; Steve Geick, Fishes; Dennis Gorman, Insects; Henry Greenwald, Invertebrates; Jennifer Harden, Amphibians and Reptiles; Eunice Hoshizaki, Mammals; Fui Lian Inger, Amphibians and Reptiles; George Kalins, Invertebrates; Dorothy Karall, Invertebrates; Muhammad Zaheer Khan, Fishes; Lawrence Levin, Zoology; Armand Littman, Invertebrates; James Miller, Invertebrates; Sara Murphy, Amphibians and Reptiles; Tracy Neff, Mammals; Yelena Petrosyan, Invertebrates; James Pulizzi, Amphibians and Reptiles; Sheila Reynolds, Mammals; Tony Richter, Mammals; Honerée Romano, Insects; Josephine Rood, Insects; Yih-cheng Vincent Shiau, Jack Sloan, Mammals; Insects; Edward Byron Smith, III, Fishes; Minh-Tho Solomon, Mammals; Jennifer Swanson, Amphibians and Reptiles; Gail Tangeros, Insects; Christine Taylor, Insects; Kathy Telfer, Mammals; Paul Thomas, Insects; Bill Ujvari, Invertebrates; David Walker, Invertebrates; David Ward, Invertebrates; Jennifer Wheeler, Fishes; James Whitcomb, Amphibians and Reptiles; Sylvia Winter, Invertebrates; Laura Zaidenberg, Mammals

DEPARTMENT OF BOTANY

Associate

Betty Strack, M.S., Mycology

Field Associates

Sandra Knapp, Ph.D., Vascular Plants

David P. Lewis, M.S., Mycology

Marko Lewis, Bryology

Antonio Molina R., Ing. Agr., Vascular Plants

Research Associates

Janis B. Alcorn, Ph.D., Ethnobotany

Robert F. Betz, Ph.D., Vascular Plants

Paul A. Colinvaux, Ph.D., Paleoecology

William T. Crowe, Ph.D., Archeobotany

Paulo E. De Oliveira, Ph.D., Paleoecology

Sylvia Feuer-Forster, Ph.D., Palynology

Robin B. Foster, Ph.D., Vascular Plants

Jesus Garcia J., Biol., Mycology

Nancy Garwood, Ph.D., Vascular Plants

Sidney F. Glassman, Ph.D., Vascular Plants

Luis D. Gomez, Ph.D., Mycology

Patrick Herendeen, Ph.D., Vascular Plants

Sara Hoot, Ph.D., Vascular Plants

Michael Huft, Ph.D., Vascular Plants

Sabine Huhndorf, Ph.D., Mycology

Kuswata Kartawinata, Ph.D., Vascular Plants

Timothy J. Killeen, Ph.D., Vascular Plants

Sr. Jorge Gomez-Laurito, B.S., Vascular Plants

Blanca Leon, Pteridology

Rogers McVaugh, Ph.D., Vascular Plants

Gary L. Smith Merrill, Bryology

Cirilo Nelson, Ph.D., Vascular Plants

Lorin I. Nevling, Jr., Ph.D., Vascular Plants

Patricio P. Ponce de Leon, Ph.D., Mycology

Jacinto C. Regalado, Jr., Ph.D., Vascular Plants

Abundio Sagastegui, Ph.D., Vascular Plants

Isidoro Sanchez V., Ph.D., Vascular Plants

Pablo E. Sanchez V., M.Sc., Vascular Plants

Rudolf M. Schuster, Ph.D., Bryology

Rolf Singer, Ph.D., Mycology

D. Doel Soejarto, Ph.D., Vascular Plants

Tod F. Stuessy, Ph.D., Vascular Plants

Kenneth Young, Ph.D., Vascular Plants

DEPARTMENT OF GEOLOGY

Associate

Doris Nitecki, M.A., Paleontology

Field Associate

Thomas Guensburg, Ph.D., Fossil Vertebrates

Research Associates

Edgar Allin, Ph.D., Fossil Vertebrates

David Bardack, Ph.D., Fossil Vertebrates

William Bemis, Ph.D., Lungfishes, Other "lower" Vertebrates,

Frank Carpenter, Sc.D., Fossil Invertebrates

Robert Clayton, Ph.D., Geochemistry

Andrew Davis, Ph.D., Geochemistry

Robert DeMar, Ph.D., Fossil Vertebrates

Daniel Fisher, Ph.D., Fossil Invertebrates

Catherine Forster, Ph.D., Fossil Vertebrates

Gary Galbreath, Ph.D., Fossil Vertebrates

Terry Grande, Ph.D., Fossil Fishes

Lawrence Grossman, Ph.D., Meteoritics

William Hammer, Ph.D., Antarctic Dinosaurs

James Hopson, Ph.D., Fossil Vertebrates

David Jablonski, Ph.D., Fossil Invertebrates

Michael LaBarbera, Ph.D., Fossil Invertebrates

Ricardo Levi-Setti, Ph.D., Fossil Invertebrates

Ernest Lundelius, Ph.D., Fossil Vertebrates

Frank McKinney, Ph.D., Fossil Invertebrates

J. Michael Parrish, Ph.D., Fossil Reptiles

David Raup, Ph.D., Fossil Invertebrates

J. John Sepkoski, Ph.D., Fossil Invertebrates

Paul Sereno, Ph.D., Fossil Reptiles

Paul Sipiera, Ph.D., Meteoritics

Joseph V. Smith, Ph.D., Mineralogy

Leigh Van Valen, Ph.D., Fossil Vertebrates

DEPARTMENT OF ZOOLOGY

Associates

Barbara Brown, B.A., Primates
Sophie Ann Brunner, Preparation of Skeletons
Edward C. Dickinson, Philippine Birds
Ingrid Fauci, Collection Management, Translations
Elizabeth-Louise Girardi, Ph.D., Land Snails
Dorothy Karall, B.A., Illustration
Anthony Milewski, B.S., Large Mammal Comparative Ecology
Paula Mikkelsen, B.S., Marine Mollusks
Harry G. Nelson, S.B., Systematics of Dryopoid Coleoptera
Raymond Pawley, B.S., Herpetology
John A. Wagner, Ph.D., Insects

Field Associates

Fred Aslin, Land Snails, Geology, Biology
Jan Aslin, Land Snails, Geology, Biology
Barbara Becker, M.A., Zoology Research
Leif Davenport, Mammals of Burundi
Susan Davis, M.S., Neotropical Birds
John Douglas, M.S., Naturalist
Brian Fisher, M.S., Ants of Madagascar
Bruce Hayward, Ph.D., African Mammals
Kiew Bong Heang, Ph.D., Sea Snakes
Ghazally Ismail, Ph.D., Sponsorship of Research in Malaysia
Scott Lindbergh, Brazilian Mammals
Daryl Karns, Ph.D., Herpetology and Community Ecology
Douglas Kelt, M.S., Chilean Mammals
Vince Kessner, Land Snails
David Matusik, Lepidoptera Taxonomy
Edward Moll, Ph.D., Biology of Freshwater Turtles
John Murphy, M.S., Herpetology
Laurie Price, Land Snails
Janice K. Street, Mammals Worldwide
William S. Street, Mammals Worldwide
Walter R. Suter, Ph.D., Systematics of Scydmaenidae (Coleoptera)
Blas Tabaranza, M.S., Philippine Mammals
Donald Taphorn, South American Fresh Water Fishes
Ruth Utzurum, M.S., Philippine Mammals
Robert J. Wolff, Ph.D., Systematics of the Araneida

Research Associates

Peter L. Ames, Ph.D., Syringeal Morphology of Passerine Birds
Warren Atyeo, Ph.D., Systematics of Acari
William Beecher, Ph.D., Jaw and Limb Adaptations Among Passerine Birds
Angelo Capparella, Ph.D., Neotropical Birds
Donald S. Chandler, Ph.D., Systematics of Pselaphidae (Coleoptera)
Dale Clayton, Ph.D., Host/Parasite Coevolution
Joel Cracraft, Ph.D., Avian Systematics and Evolutionary Biology
Marian Dagosta, Ph.D., Primates
Sharon Emerson, Ph.D., Functional Anatomy of Anura
John Fitzpatrick, Ph.D., Neotropical Birds
Jack Fooden, Ph.D., Asian Primates
Daniel Gebo, Ph.D., Primates
Bruce C. Jayne, Ph.D., Marine and Estuarine Snakes

Julian Kerbis Peterhans, Ph.D., Mammals
 Linda Kinkel, Ph.D., Ring-billed Gulls
 David H. Kistner, Ph.D., Systematics of Ants and Termites
 R. Eric Lombard, Ph.D., Functional Anatomy of Reptiles
 Peter E. Lowther, Ph.D., Field Museum Nest and Egg Collection
 Antonio Machado-Allison, Ph.D., South American Fishes
 Yang Chang Man, B.S., Decapods
 Patricia McGill, Ph.D., Behaviour and Ecology of Herring Gulls
 Peter Meserve, Ph.D., Population Ecology of Small Mammals
 Debra K. Moskovits, Ph.D., Rainforest Conservation
 W. Wayne Moss, Ph.D., Systematics and Phylogeny of Bird Skin Parasites
 Charles Nadler, M.D., Sciuridae
 Roy A. Norton, Ph.D., Systematics of Acari
 Charles Oxnard, Ph.D., Vertebrate Anatomy
 Victor Pacheco, M.A., Peruvian Mammals
 Ronald Pine, Ph.D., Taxonomy of South American Mammals
 Philip D. Perkins, Ph.D., Aquatic Coleoptera
 Stephen Pruett-Jones, Ph.D., Behavior and Ecology of Birds of Paradise
 George B. Rabb, Ph.D., Taxonomy of Salamanders, Phylogeny of Snakes
 Matthew Ravosa, Ph.D., Primates
 Charles Reed, Ph.D., Morphology and Evolution of Mammals
 Eric A. Rickart, Ph.D., Biogeography of Mammals in Southeast Asia
 Jennifer Shopland, Ph.D., Ecology of Mixed-Species Bird-flocks in the Neotropics
 Petra Sierwald, Ph.D., Systematics, Morphology and Evolution of Spiders (Arachnida: Araneae)
 Ronald Singer, D.Sc., Mammalian Anatomy
 Robert Stuebing, M.S., Malaysian Ecology
 Margaret K. Thayer, Ph.D., Systematics of Staphylinidae (Coleoptera)
 Jamie Thomerson, Ph.D., Central and South American Fishes
 Robert Timm, Ph.D., Central and South American Mammals
 Robert Traub, Ph.D., Siphonaptera
 Richard Wassersug, Ph.D., Tadpole Research
 John Wible, Ph.D., Higher level taxonomy of Mammals
 Glen Woolfenden, Ph.D., Florida Scrub Jay
 Guanfu Wu, Chinese Fauna, Systematics
 Ermi Zhao, Ph.D., Chinese Herpetofauna, Systematics

CEEB—COLLECTION STATISTICS, 1993

COLLECTION SIZE AND GROWTH

DEPARTMENT OF BOTANY ¹	1992	1993	1992-1993
	Number of Specimens	Number of Specimens	% growth
Algae	78,132	78,132	0
Fungi: Basidiomycetes	58,466	59,337	1.5
Fungi: Ascomycetes and Miscellania	33,319	33,416	0.3
Lichens	52,367	52,385	0.03
Bryophytes	179,122	183,242	2.2
Pteridophytes	98,296	113,785	13.6
Gymnosperms	10,150	10,300	1.46
Angiosperms	2,055,783	2,014,635	-2.0
Botany Subtotal	2,565,635	2,545,232	-0.8
DEPARTMENT OF GEOLOGY			
	Number of Specimens	Number of Specimens	% growth
Physical Geology	62,929	62,979	0.08
Invertebrate Paleontology	319,267	319,275	0.002
Plant Paleontology	79,460	80,100	0.81
Vertebrate Paleontology	134,606	134,985	0.28
Geology Subtotal	596,262	597,339	0.2
DEPARTMENT OF ZOOLOGY			
	Number of Specimens	Number of Specimens	% growth
Amphibians and Reptiles	250,610	265,000	5.4
Birds	394,000	400,000	1.5
Fishes	1,769,991	1,784,064	0.8
Insects	9,886,646	9,934,989	0.49
Invertebrates	3,835,500	3,890,500	1.4
Mammals	146,589	150,764	2.8
Zoology Subtotal	16,283,336	16,425,317	0.86
CEEB—TOTAL SPECIMENS	19,445,233	19,567,888	0.627

¹Changes in totals for botany collections partly reflect the results of major inventory of botanical specimens undertaken in late 1993.

CEEB, COLLECTION STATISTICS, 1993

USE OF COLLECTION BY LOAN

DEPARTMENT OF BOTANY

	Number of Loans	Number of Specimens Loaned	Number of Specimens Borrowed
Algae	1	310	0
Fungi: Basidiomycetes	6	392	392
Fungi: Ascomycetes and Miscellania	0	0	0
Lichens	0	0	0
Bryophytes	20	2462	340
Pteridophytes	9	941	87
Gymnosperms	0	0	0
Angiosperms	141	18,762	2,108
Botany Subtotal	177	22,867	3,237

DEPARTMENT OF GEOLOGY

	Number of Loans	Number of Specimens Loaned	Number of Specimens Borrowed
Physical Geology	24	106	0
Invertebrate Paleontology	12	89	0-
Plant Paleontology	2	9	0
Vertebrate Paleontology	36	284	0
Geology Subtotal	74	488	0

DEPARTMENT OF ZOOLOGY

	Number of Loans	Number of Specimens Loaned	Number of Specimens Borrowed
Amphibians and Reptiles	93	959	655
Birds	88	2,035	208
Fishes	51	3,512	877
Insects	135	20,369	8,716
Invertebrates	21	1,065	40
Mammals	72	1,048	874
Zoology Subtotal	460	28,988	11,370
CEEB — TOTAL LOANS	711	52,343	14,607

CEEB, COLLECTION STATISTICS, 1993

SCHOLARLY USE OF COLLECTIONS BY VISITORS

DEPARTMENT OF BOTANY

	Number of Professionals	Number of Students	Number of Others	Total Visitors
Algae	0	1	0	1
Fungi: Basidiomycetes	8	2	0	10
Fungi: Ascomycetes and Miscellania	1	0	0	1
Lichens	0	0	0	0
Bryophytes	3	3	0	6
Pteridophytes	3	0	0	3
Gymnosperms	0	0	0	0
Angiosperms	73	31	27	131
Botany Subtotal	88	36	27	152

DEPARTMENT OF GEOLOGY

	Number of Professionals	Number of Students	Number of Others	Total Visitors
Physical Geology	4	5	20	29
Invertebrate Paleontology	3	25	6	34
Plant Paleontology	3	3	0	6
Vertebrate Paleontology	30	25	7	62
Geology Subtotal	40	58	33	131

DEPARTMENT OF ZOOLOGY

	Number of Professionals	Number of Students	Number of Others	Total Visitors
Amphibians and Reptiles	18	29	64	111
Birds	38	54	158	250
Fishes	29	23	91	143
Insects	28	12	16	56
Invertebrates	15	31	54	100
Mammals	63	40	109	212
Zoology Subtotal	191	189	492	872
CEEB — TOTAL VISITORS	319	283	552	1155

Center for Cultural Understanding and Change





The Field Museum
Center for Cultural Understanding and Change

SELECTED RESEARCH PROGRAMS

THAILAND—Ancient Settlement and Trade in Thailand—Bennet Bronson, Anthropology and Chuimei Ho, Research Associate, Anthropology— This project has involved jointly conducted surveys along the coast of southern Thailand as well as excavations at the ancient seaports of Laem Pho and Ko Kho Khao. The main collaborators are Thai Fine Arts Department archaeologists Amara and Tharapong Srisuchat and SPAFA (Bangkok) senior archaeologist Pisit Charoenwongsa. The field phase of this stage of the project was completed in 1991 and analysis and writing up of results is now under way. Results have been to shed important new light on patterns of early international trade, and other researchers (in Thailand and Indonesia) have begun to use the system of classification we devised for early East and Southwest Asian wares.

ASIA—Metallurgy in Ancient Asia—Bennet Bronson, Anthropology—This project is focussed on the general theme of early commercial competition, the effects of technological progress, and the causes of economic development and decline, particularly as it relates to the subject of ancient metal production and manufacturing in Asia. In this region metallurgy developed early and reached levels of technical excellence not matched elsewhere in the world until the late 19th century. Since 1985, working with several collaborators and making extensive use of museum collections, several studies have been published on early and traditional metalworking in Indonesia, India, Thailand, China and Japan. Current research efforts are focused on early Chinese bronze and iron, Indonesian weapons and South Asian steel.

MELANESIA—The A. B. Lewis Project—John E. Terrell and Robert L. Welsch, Visiting Associate Curator, Anthropology— In 1909, A. B. Lewis, Assistant Curator of African and Melanesian Ethnology at Field Museum, undertook a research expedition that acquired the largest collection of Melanesian art and material culture ever gathered by a single collector. The A. B. Lewis collection contains thousands of masks, carvings, and ornamental objects from hundreds of villages, as well as extensive sketches, diaries, letters, and photographs of village life as he saw it. Beginning more than 80 years after Lewis' journey, the A. B. Lewis Project was based around extensive field research on the north coast of Papua New Guinea. Using modern technology and research tools unavailable in Lewis' time, new information is being gathered from many of the same communities Lewis investigated. By refocusing attention on regional trade networks and the resulting cultural variation in this area, these findings will provide new insight into the extraordinary diversity of Melanesian peoples. This project bridges the gap between traditional museum anthropology and modern ethnographic research by combining collections-based, museum research with extensive field studies of current societies for a broader understanding of the origin and evolution of Melanesia's cultural diversity.

PERU—Origin and Evolution of Prehispanic Civilizations of Southern Peru—Charles Stanish, Anthropology—The Titicaca Basin of southern Peru is one of the heartlands of ancient Andean society, and has a long and complex history of cultural evolution. The first settled villages in the Titicaca Basin began around 2000 BC and by 200 BC, Members' Night, archaic states controlled vast areas of agricultural land and built impressive irrigation systems. This project has studied these societies paying special attention to the rise and fall of ancient agricultural systems. In the last five years, almost 500 sites have been discovered. Supplementary to this work are two major research projects on Field Museum collections. One is a study of ceremonial Inca (circa AD 1350-1550) pottery from Cuzco and a second is a study of prehispanic (circa AD 1100-1350) shamanistic artifacts from the northern Chilean coast.

AMAZONIA—Human Ecology and Cultural Evolution in the Amazon Basin—Anna C. Roosevelt, Anthropology— While most of the interior of Amazonia consists of nutrient-poor soils subject to erosion in the absence of trees, the extensive lowland flood plains of the Amazon supported relatively advanced cultures for thousands of years. These culminated in agricultural chiefdoms with sophisticated pottery, handicrafts, and trade that were destroyed by the European conquest in the 17th century. It now appears that aspects of the “traditional” culture of some Indians of the rain forest are actually a recent phenomenon — in some cases, a lifestyle devised by refugees from colonization; in others, a return to lifeways antedating the chiefdoms. Prehistoric Amazonian pottery cultures that are also at least 1,000 years older than any found elsewhere in the Americas, are challenging the conventional understanding of the diffusion of culture in the New World. These results show that not only were some Amazonian Indians productive agriculturalists, but they introduced to their local ecosystems some exotic plants that have helped make the rain forest what it is today. Results from this project emphasize that neither present-day Indian culture nor the rain forest itself is a completely “natural” phenomenon.

SOUTHWEST NORTH AMERICA- The Evolution of Cultural Systems in the Southwestern United States—Winifred Creamer and Jonathan Haas, Anthropology—It has long been held that infectious diseases borne by the conquistadors and colonialists who reached the upper Rio Grande Valley in the mid-16th Century decimated the Pueblos and forced them to abandon settlements that were sometimes as large as 3,000 rooms. This ten-year project of excavation and analysis seeks to understand the nature of change in pueblo society between 1450, nearly a century before contact, and the Pueblo Revolt of 1680. Successive phases of the work address changes in demography, economics, and political/religious organization. Examination of the ruins of 13 pueblos in the Rio Grande Valley between Taos and Albuquerque show that half of them were apparently abandoned prior to contact while others were still occupied after contact. More extensive excavation at one of the largest sites, Pueblo San Marcos south of Santa Fe, which contains some 2,000 ground floor rooms, is helping to determine how many rooms were simultaneously occupied. The conclusions may alter long-accepted views of pueblo demographics as well as the nature of interactions between colonist and Pueblo groups.

Selected Publications Based on CCUC Programs

Bronson, B., C. M. Ho, P. Charoenwogs, and T. and A. Srisuchat. 1991. Newly Identified Chinese Ceramic Wares from Ninth Century Trading Ports in Southern Thailand. SPAFA Digest 11, (3): 12-17. Bangkok.

Bronson, B., T. Srisuchat, C. M. Ho, and A. Srisuchat. 1991. Early Chinese ceramics in Southern Thailand. Silpakorn Journal of the Fine Arts Department of Thailand 33, 4: 15-29. Bangkok.

Bronson, B. 1992. The Early Southeast Asian Metals Trade. Pp. 110-146, In: I. Glover (ed.), Early Metallurgy, Trade and Urbanism in Thailand and Southeast Asia White Lotus Press, Bangkok.

Creamer, W. 1992. The Architecture of Arroyo Hondo, New Mexico. School of American Research Press. Santa Fe.

Haas, J. and W. Creamer. 1992. Demography and the Proto-Historic Pueblos of the Northern Rio Grande: A.D. 1450-1680. Pp. 21-27, in B. Vierra (ed.), Late Prehistoric and Early Historic New Mexico. New Mexico Archaeological Council. Albuquerque.

Ho, C. M. 1992. Trade and Manufacture: Guangdong Ceramics in the Late Tang Period. Journal of Trade Ceramic Studies 12: 158-184.

Rostoker, W. and B. Bronson. 1990. Pre-Industrial Iron: Its Technology and Ethology Archeomaterials Press, Philadelphia. 234 pp.

Stanish, C. and L. H. Steadman. (in press). Archaeological Research at the Site of Tumantamni, Peru. Fieldiana, Anthropology, n.s.

Stanish, C., L. H. Steadman, L. Onofre, E. de la Vega, K. L. Frye and S. Weintz. (in press). Archaeological Survey in the Juli-Pomata Region, Lake Titicaca, Peru. Fieldiana, Anthropology, n.s.

Stanish, C. (in press) The Hydraulic Hypothesis Revisited: A Theoretical Perspecitve on Lake Titicaca Basin Raised Field Agriculture. Latin American Antiquity.

Stanish, C., E. de la Vega M., and K. L. Frye. 1993. Domestic Architecture of Lupaga Area Sites. Pp. 1-12, In: M. Aldenderfer (ed.) Domestic Architecture in South Central Andean Prehistory. University of Iowa Press.

Stanish, C., and M. Aldenderfer. 1993. Domestic Architecture, Household, and the Past in the South Central Andes. Pp. 83-94, In: M. Aldenderfer (ed.) Domestic Architecture in South Central Andean Prehistory. University of Iowa Press.

For Additional Information Contact:

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BENNET BRONSON

Curator, Asian Archaeology and Ethnology and Chair, Anthropology Department, Field Museum; Adjunct Professor, Anthropology Department, University of Illinois at Chicago; Adjunct Professor, Center for Southeast Asian Studies, Northern Illinois University.

B.A., Harvard University, 1960.

Ph.D., University of Pennsylvania, 1976.

Editorial Advisory Board, Archaeology Magazine, 1981-92.

Editorial Board, Archeomaterials, 1986-93.

Co-Director, Program for Ancient Settlement and Trade in Thailand (PASTT), 1988-93.

Economic and social evolution, with special reference to early technology and trade in Asia.

The ancient world had surprising similarities to our own in terms of the importance of commercial competition, the effects of technological progress, and the causes of economic development and decline. In line with these interests I have been involved for a number of years in a program of archaeological and ethnographic work in Asia combined with research on the Asian collections of the Field Museum. I have collaborated with several specialists outside the museum on studies of early metallurgy in Southeast Asia and China. With my in-museum colleague, Research Associate Chuimei Ho, I have now completed most of the analysis and writing-up of excavations jointly conducted by the Field Museum and the Thai Fine Arts Department at ancient seaports in southern Thailand. This has thrown new light on patterns of early international trade. We are now planning to extend these investigations to China and Indonesia. Discussions with archaeological institutions in both countries are currently under way.

I am also engaged in several smaller collections-oriented research projects. These include studies of Chinese and Japanese bronze objects dating to AD 1400-1900, of Chinese and Indonesian pigeon and cricket keeping, of East and Southeast Asian textiles, of early glass and glaze chemistry, and of Indonesian-Philippine ethnographic art. At present I am supervising research by students from four local universities.

* * *

1986. The Making and Selling of Wootz, a Crucible Steel of India. Archeomaterials 1(1): 13-51.

1987. Terrestrial and Meteoritic Iron in the Indonesian Kris. Journal of Historical Metallurgy 221: 8-15.

1988. (with P. Charoenwongsa) The Stone and Metal Ages of Thailand Monographs in Thai Antiquity, Vol. 1. Thai Archaeology Working Group, Bangkok. 135 pp.

1990. (with W. Rostoker) Pre-Industrial Iron: Its Technology and Ethnology. Archeomaterials Press, Philadelphia. 234 pp.

1991. Export Porcelain in Economic Perspective: The Asian Ceramic Trade in the 17th Century. Pp. 126-151, In: C. M. Ho (ed.), Ancient Ceramic Kiln Technology in Asia. Centre of Asian Studies, University of Hong Kong.

1992. (with J. C. White) Radiocarbon and Chronology in Southeast Asia Pp. 491-504 (vol.1) and Pp. 475-515 (vol. 2) In: R. Ehrich (ed.), Radiocarbon and Chronology in the Old World, 3rd ed.

WINIFRED CREAMER

Visiting Assistant Curator, Northern Rio Grande Research Project Department of Anthropology, Field Museum; Assistant Professor, Department of Anthropology, Northern Illinois University.

Ph.D., Tulane University, 1983.

Evolution of cultural systems with a focus on archaeology of the southwestern U. S.

I was recently the recipient of a National Science Foundation Career Advancement Award to upgrade my statistical analysis skills as they apply to archaeological data. This fellowship provided extra time used for analysis of ceramics from Pueblo villages occupied both just before and just after the arrival of Europeans in New Mexico. The project continues to focus on regional demography during the Protohistoric period (AD 1450-1680). Presentations at professional meetings focused on ceramic analysis used to partition the protohistoric into shorter time units, and on illustrating sequential construction and use of structures once thought to be built and used simultaneously.

Undergraduate and graduate students from the University of Illinois at Chicago, Northern Illinois University, the University of Chicago, and other institutions continue to participate in project research, along with a dedicated group of volunteers.

* * *

1990. Archaeologists Ethical Dilemmas: Collecting, Collectors, Collections Anthropology Newsletter, May 1990.

1990. The Study of Prehistoric Demography in the Northern Rio Grande Valley. Paper presented at the 59th Annual Meeting of the American Association of Physical Anthropologists, Miami, April 3-7, 1990. American Journal of Physical Anthropology 81(2):210.

1991. (with J. Haas) Search for the Ancient Ones: Pueblo. National Geographic Magazine, October; 84-99.

1992. Regional Exchange Along the Pacific Coast of Costa Rica, During the Late Polychrome Period, A.D. 1200-1550. Journal of Field Archaeology 19: 1-16.

1992. (with J. Haas) Demography and the Proto-Historic Pueblos of the Northern Rio Grande: A.D. 1450-1680 Pp. 21-27, In: B. Vierra (ed.), Late Prehistoric and Early Historic New Mexico. New Mexico Archaeological Council, Albuquerque.

1993. (with J. Haas) The Architecture of Arroyo Hondo, New Mexico. School of American Research Press. Santa Fe.

1993. (with J. Haas) Stress and Warfare Among the Kayenta Anasazi of the 13th Century A.D. Fieldiana, Anthropology, n.s. 21: 1-211.

1993. (with J. Haas) Review of Wealth and Hierarchy in the Intermediate Area, edited by Frederick W. Lange. Washington, D.C.: Dumbarton Oaks. Science 260: 245-247.

1993. Review of The Ancient Americas: Art From Sacred Landscapes, Chicago: Art Institute of Chicago, including both the publication and the exhibit. Museum Anthropology 17: 80-85.

JONATHAN HAAS

MacArthur Curator of North American Anthropology, Department of Anthropology, Field Museum;
External Professor, Santa Fe Institute; Research Associate, Department of Anthropology, University of
Chicago.

B.A. Anthropology, University of Arizona, 1970.

Ph.D. Anthropology, Columbia University, 1979.

Review Committee for the Native American Graves Protection and Repatriation Act.

Chair, Task Force on Anthropology and the Environment, American Anthropological Association, 1991.

Executive Committee, Association of Systematic Collections, 1991-1993.

Advisory Board, Chicago Area Fulbright Scholar Program. Council for Int. Exchange of Scholars.

Committee on Museums and Native American Collaboration, American Association of Museums.

Series Editor, School of American Research Adv. Seminar Series, Cambridge Univ. Press, 1986-1989.

Chair, Membership Committee, Society for American Archaeology, 1985-1988.

Evolution of cultural systems with a focus on archaeology of the southwestern U.S.

At the end of 1993 I stepped down from my position as Vice President of Museum Affairs with a sense of both relief and accomplishment. I am focussing my energy on project related to research, exhibits and collections. My current research in the Southwest is a long term project with my colleague, Dr. Winifred Creamer, looking at the effects of European contact and colonialism on the Pueblo peoples of northern New Mexico in the 15th and 16th centuries AD. The initial focus of the project is on possible changes in the size and distribution of the population in the region during the period from 1450-1680. By examining changing population figures for this period we hope to gain insights into the possible effects of Spanish diseases and regional warfare on the Pueblo peoples. In the laboratory, our Post-Doctoral assistant Lisa Renken is supervising the analysis and statistical manipulation of the ceramic data we recovered from a sample of 13 of the 65 known protohistoric sites in the northern New Mexico area.

In 1993, with James Carucci, we initiated a long term project to inventory and catalog the extensive collections made by Paul Martin in the southwestern United States. I am also heavily involved with activities related to repatriation and continue to work with a wide range of North American Indian tribes in the appropriate care and treatment of important cultural objects and human remains.

* * *

1985. (with W. Creamer) Tribe and Chiefdom in Lower Central America. American Antiquity 50(4): 738-754.

1987. (with S. Pozorski and T. Pozorski) The Origin and Development of the Andean State. Cambridge University Press. 188pp.

1989. The Evolution of the Kayenta Regional System. Pp. 491-508, In: S. Upham and K. Lightfoot (eds.), The Sociopolitical Structure of Prehistoric Southwestern Societies. Westview Press.

1990. The Anthropology of War. Cambridge University Press.

1992. (with T. Boyd) The Native American Graves Protection and Repatriation Act: Prospects for New Partnerships between Museums and Native American Groups. Arizona State Law Journal, March, 1992 Vol. 24(1): 253-282.

1993. (with W. Creamer). Stress and Warfare Among the Kayenta Anasazi of the 13th Century a.d. Fieldiana, Anthropology, n.s. 21: 1-211.

CHUI MEI HO

Research Associate, Asian Archaeology and Ethnology, Anthropology Department, Field Museum;
Adjunct Research Associate, Centre for Southeast Asian Studies, Northern Illinois University;
Research Associate, Centre of Asian Studies, University of Hong Kong.

B.A., University of Hong Kong, 1977.

M.Phil., University of London, 1980.

Ph.D., University of London, 1984.

Collection Committee, Museum of Art, Beloit College, Wisconsin, 1993-94.

Executive Committee, Chinese Ancient Ceramic Society, China, 1993-94.

Vice-Chairman, Committee for Friends of the Museum, Dehua Ceramic Museum, China, 1993-94.

Lecturer, Indonesian Field School of Archaeology, 1993.

Editor, ACRO Update, an international quarterly newsletter for the study of Asian ceramics, Chicago, 1993-4.

Early communications between China and other East Asian and Southeast Asian countries, particularly through the study of archaeological ceramics.

The study of interregional relationships among East and Southeast Asia countries through archaeological materials of the last two thousand years has filled in many details about those societies. I have initiated and/or participated in a number of field projects studying ancient ceramic industrial sites in China, Korea, Japan and Thailand. I have also worked at early seaport sites in Thailand and Indonesia, where imported ceramics were traded and used. The results have helped to explain the evolution of local economies and interregional trade. I have also done research on ceramic ethnoarchaeology aimed at understanding technology and industrial organization in less developed communities of the present day.

* * *

1986. (with W. Watson and I. Freestone) Thin-Section Analysis of Pre-Iron Age Pottery in Southeast Asia. Pp. 369-373, In: Shanghai Institute of Ceramics (ed.), Scientific And Technological Insights on Ancient Chinese Pottery and Porcelain, Proceedings of the International Conference on Ancient Chinese Pottery and Porcelain Held in Shanghai, 1982, Shanghai.

1988. Minnan Blue and White. An Archaeological Survey of Ancient Kiln Sites in South Fujian. British Archaeological Research Centre, Oxford. 230 pp.

1990. Ancient Ceramic Kiln Technology in Asia. Centre of Asian Studies, University of Hong Kong.

1991. Chinese Presence in Southern Thailand Before 1600 AD From Archaeological Evidence. Pp. 289-307, In: China and the Maritime Silk Route. Quanzhou International Seminar on China and the Maritime Routes of the Silk Roads Organization Committee, Fujian.

1992. Trade and Manufacture: Guangdong Ceramics in the Late Tang Period. Journal of Trade Ceramics 12: 159-184.

DAVID S. REESE

Research Associate, Department of Anthropology, Field Museum.

A.B., Harvard College, 1977.

Ph.D., University of Cambridge, 1988.

Postdoctoral Fellow, NSF/NATO, 1992-1993.

Charles U. Harris and Janet C. Harris Fellow, American Schools of Oriental Research, 1993.

Archeozoology of the Mediterranean Basin and Near East.

From October 1992 to June 1993 I held a NSF/NATO Postdoctoral Fellowship in Science and Engineering in Utrecht (seven months) and Groningen (two months) studying both paleontological and archaeological fauna now stored in Utrecht, Amsterdam, Leiden, and Groningen (The Netherlands). While in the Netherlands I lectured at universities in Utrecht, Groningen, and Leiden. In 1993 I also conducted field research in Greece and Italy and museum research in Freiburg and Karlsruhe (Germany), in Nauplion (Greece), and in London.

In April 1993 I organized an international workshop in Utrecht on "The Pleistocene and Holocene Fauna of Crete and its First Settlers." I am now editing the proceedings from that conference for publication.

I continue to research and publish on faunal remains from archaeological sites in the Mediterranean Basin and Near East. One major project completed in 1993 was a monograph on "The Pleistocene Vertebrate Fauna of Cyprus" to be published by the government of Cyprus as Geological Survey Department Bulletin 9. I am also working on a book entitled Shells to be published by Cambridge University Press in their Manuals in Archaeology series.

* * *

1987. Marine and Fresh-water Molluscs. Pp. 119-134 In: P. Hellström (ed.), Paradeisos, A Late Neolithic Settlement in Aegean Thrace. Memoir 7. Stockholm: Medelhavsmuseet.

1988. Shells and Fish from Maa-Palaeokastro. Pp. 458-466, In: V. Karageorghis and M. Demas (eds.), Excavations at Maa-Palaeokastro 1979-1986. Nicosia: Department of Antiquities.

1988. A New Engraved Tridacna Shell from Kish. Journal of Near Eastern Studies 47(1): 35-41.

1988. (with V. J. Hutchinson) A Worked Bone Industry at Carthage. Pp. 549-594, In: J. H. Humphrey (ed.), The Circus and a Byzantine Cemetery at Carthage I. Ann Arbor: The University of Michigan Press.

1989. Faunal Remains from the Altar of Aphrodite Ourania, Athens. Hesperia 58(1): 63-70.

1991. The Trade of Indo-Pacific Shells into the Mediterranean Basin and Europe. Oxford Journal of Archaeology 10(2): 159-196.

1991. Marine Shells in the Levant: Upper Paleolithic, Epipaleolithic, and Neolithic. Pp. 613-628, In: O. Bar-Yosef and F. R. Valla (eds.), The Natufian Culture in the Levant. Archaeological Series 1. Ann Arbor: International Monographs in Prehistory.

1992. Recent and Fossil Invertebrates (with a Note on the Nature of the MH I fauna). Pp. 770-778, In: W. A. McDonald and N. C. Wilkie (eds.), Excavations at Nichoria in Southwest Greece II The Bronze Age Occupation. Minneapolis: University of Minnesota Press.

ANNA C. ROOSEVELT

Curator, Archaeology, Department of Anthropology, Field Museum; Adjunct Professor, University of Illinois at Chicago; Adjunct Professor, Northwestern University.

B.A. History, Stanford University, 1968.

M. A., Anthropology, Columbia University, 1974.

Ph.D., Anthropology, Columbia University, 1977.

National Endowment for the Humanities Fellow.

MacArthur Fellow, 1988-92.

Phi Beta Kappa Visiting Scholar, 1993-94.

Research Associate, American Museum of Natural History, 1986-present.

Editorial Board, *Latin American Antiquity*, 1989-93, *Latin American Anthropology Review*, 1990-present.

Board of Directors: American Association for the Advancement of Science, Rainforest Alliance, Latin American Scholarship Program in American Universities.

Charles U. Harris and Janet C. Harris Fellowship of the American Schools of Oriental Research, 1986-1993.

Human Ecology and Cultural Evolution; Environmental Archaeology; Geoarchaeology.

My research focuses on human cultural development and the relationship of humans with their environments in the tropical lowlands of South and Central America. I have carried out research with a cross-disciplinary team in Brazil since 1983. The research has uncovered information about the human occupation of the Amazon, revealing a long, complex trajectory of development from late Pleistocene hunter-gatherers at 1,100-10,000 years ago and eight thousand-year old pottery-age fishing cultures to populous agricultural chiefdoms in the sixteenth century. We are applying the evidence of this wide range of different land use systems to conservation and development planning in the region. I teach both graduate students and undergraduates, and students work with me in my laboratory at the Museum and on field expeditions.

* * *

1989. Resource Management in Amazonia before the European Conquest: Beyond Ethnographic Projection. Pp. 30-61, In: D. Posey and W. Balee (eds.), Natural Resource Management by Indigenous and Folk Societies in Amazonia, New York Botanical Garden: Advances in Economic Botany, No. 7.

1991. Moundbuilders of the Amazon: Geophysical Archaeology on Marajo Island, Brazil. New York: Academic Press.

1991. Determinismo Ecologico na Interpretacao do Desenvolvimento Social Indigena de Amazonia. Pp. 103-141, In: W. Neves (ed.), Origens, Adaptacoes, e Diversidade Biologica do Homem Nativo da Amazonia. Belem: Museu Paraense Emilio Goeldi.

1991. (with R. Housley, I. Imazio da Silveira, S. Maranca, and R. Johnson) Eighth Millennium Pottery from a Shell Midden in the Brazilian Amazon. Science 254(5038): 1621-1624.

1992. Sociedades Prehistoricas no Amazonas Brasileiro. Pp. 17-45, In: J. Diaz (ed.), Nos Vesperos do Numdo Moderno: Brasil, Lisbon: Comissao Nacional para as Comemoracoes dos Descobrimentos Portugueses.

1992. Argueologia Amazonica. Pp. 53-86, In: M. C. da Cunha (ed.), Historia dos Indios no Brasil.

1993. The Rise and Fall of the Amazon Chiefdoms. Pp. 255-284, In: A.-C. Taylor and P. Descola (eds.), Le Remontee de L'Amazone: Anthropologie et Histoire des Societes Amazoniennes, L'Homme 33 (126-128), Special Issue. Paris.

CHARLES S. STANISH

Associate Curator and Vice-Chair, Department of Anthropology, Field Museum; Research Associate, Department of Anthropology, University of Chicago; Adjunct Professor, Department of Anthropology, University of Illinois, Chicago.

Ph.D., A.M., The University of Chicago, 1985.

Editorial Board Member, *Prehistory Press*, South America.

Book Review Editor, *Latin American Antiquity*, (1992-1993).

Vice President, Chicago Archaeological Society.

Prehispanic civilizations of southern Peru and western Bolivia in the high southern Andes.

I am interested in using regional settlement data to model the origin and collapse of complex political systems and their associated agricultural systems. Over the past three years, my research team has discovered dozens of archaeological sites that date from 2000 b.c. to the Spanish Colonial Period. We specifically studied the ancient irrigation of the Spanish Colonial Period as it changed over time. We learned that progressive drought and population increases ultimately caused the collapse of the agricultural system by the 15th century.

In 1987 I began a new project on the "nuclear center of civilization" in the Titicaca Basin of southern Peru. Nuclear centers are heartlands of ancient society, with long and complex histories of cultural evolution. The first settled villages in the Titicaca Basin began around 2000 BC. By 200 BC, archaic states controlled vast areas of agricultural land and built impressive irrigation systems. We have studied these societies paying special attention to the rise and fall of ancient agricultural systems. In the last five years, we have discovered almost 400 new sites.

Over the past several years, I have published a number of scientific papers and a book on my research in the southern Andes. Our research continues in Peru supported by the National Science Foundation. We plan to return every year to continue our study of the ancient civilizations of the Titicaca Basin.

* * *

1989. Household Archaeology: Testing Models of Zonal Complementarity in the South Central Andes. *American Anthropologist* 91(1): 7-24.

1990. (with B. Bauer) Killke and Killke-related Pottery from Cuzco, Peru, in the Field Museum of Natural History. *Fieldiana, Anthropology, n.s.* 15: 1-17.

1991. A Late Prehispanic Ceramic Chronology for the Upper Moquegua Sierra, Peru. *Fieldiana, Anthropology, n.s.* 16: 1-68.

1992. *Ancient Andean Political Economy*. Austin: University of Texas Press. 212 pp.

1993. (with E. de la Vega M. & K. L. Frye) Domestic Architecture of Lupaqa Area Sites. Pp. 1-12, In: M. Aldenderfer (ed.), *Domestic Architecture in South Central Andean Prehistory*. University of Iowa Press.

1993. (with M. Aldenderfer) Domestic Architecture, Household and the Past in the South-Central Andes. Pp. 83-94, In: M. Aldenderfer (ed.), *Domestic Architecture in South Central Andean Prehistory*. University of Iowa Press.

1994. The Hydraulic Hypothesis Revisited: A Theoretical Perspective on Lake Titicaca Basin Raised Field Agriculture. *Latin American Antiquity*.

JOHN TERRELL

Curator of Oceanic Archaeology and Ethnology, Department of Anthropology, Field Museum; Adjunct Professor of Anthropology, Northwestern University.

A.B., Harvard College, 1964.

A.M., Harvard University, 1968.

Ph.D., Harvard University, 1976.

Board of Directors, Council for Museum Anthropology.

Fellow, American Anthropological Association.

Visiting Professor of Anthropology, University of Illinois at Chicago, 1993.

Senior Fulbright Fellow, University of Auckland, 1981.

National Endowment for the Arts Museum Professional Fellow, 1977.

Phi Beta Kappa, Harvard College, 1964.

The anthropology and archaeology of the Pacific Islands; ecological and biogeographical approaches in the social sciences; history and theory of science; epistemology.

As part of the A. B. Lewis Project, a joint undertaking with Visiting Associate Curator Robert L. Welsch and funded by the National Endowment for the Humanities and by the National Science Foundation, I spent four months on the north coast of Papua New Guinea in 1993 studying the complex infrastructure maintained by the local institution of "inherited friendships" which unites villages on this coast into an extensive, highly resilient interaction sphere, or "community of culture." This constitutes, in effect, a polity without (in pre-European times) an overarching political authority or governmental central place: a political form previously missed by anthropology and Western political science. We also carried out the first archaeological explorations in the area and discovered not only what is surely the long-sought answer to the origin of the Polynesians but also evidence that the community of culture on this coast attested in historic times possibly has an antiquity of at least 5,000-6,000 years.

The Kinship & Adoption Project (in collaboration with Judith Modell, Carnegie Mellon University and Laura Litten, Columbia College) is designed to strengthen anthropology's documentation of the diverse ways in which people around the world construct and evaluate human relationships.

* * *

1988. History as a family tree, history as an entangled bank. Antiquity 62: 642-657.

1990. Storytelling and prehistory. Archaeological Method and Theory 2: 1-29.

1991. (with R. L. Welsch) Continuity and change in economic relations along the Aitape coast of Papua New Guinea, 1909-1990. Pacific Studies 14: 113-128.

1992. (with R. L. Welsch and J. N. Nadolski) Language and Culture on the North Coast of New Guinea. American Anthropologist 94: 568-600.

1993. Regional Studies in Anthropology: A Melanesian Prospectus. Current Anthropology 34: 177-179.

1994. (with J. Modell) Anthropology and Adoption. American Anthropologist 96 (in press, March)

1994. Lapita as history and culture hero. In: A. Pawley, J. Davidson, and G. Irwin, (eds.), Festschrift honoring Roger C. Green. Auckland: University of Auckland. (in press)

ROBERT L. WELSCH

Visiting Associate Curator, Anthropology, Field Museum; Visiting Associate Professor, Department of Anthropology, Dartmouth College; Lecturer, Department of Anthropology, Loyola University of Chicago.

B.A., Northwestern University, 1972.

M.A., University of Washington, 1976.

Ph.D., University of Washington, 1982.

The anthropology and material culture of Papua New Guinea.

Most of the year was spent conducting fieldwork in Papua New Guinea for the A. B. Lewis Project. As team leader, I coordinated the field research activities for 6 members of this collaborative research program to investigate regional integration along the North Coast of New Guinea. The project has successfully established a collaborative relationship between Field Museum and the Papua New Guinea National Museum and Art Gallery. During the fieldwork I conducted interviews with about 130 old men about their "friends and family" networks along the coast, documenting both the extent and character of these relationships that formerly (and still) linked communities speaking dozens of different languages. Of particular interest was the movement of products, foodstuffs and raw materials among friends in these friendship networks. During the research we also collected nearly 2000 ethnological specimens documenting contemporary material culture; this collection is thought to be the largest ever assembled from this part of New Guinea, being larger than even A. B. Lewis' collection which initially motivated the project. The successful conclusion of this expedition marks another major milestone for the Lewis Project, which was begun in 1987.

* * *

1985 The Distribution of Therapeutic Knowledge in Ningerum: Implications for Primary Health Care and the Use of Aid Posts. Papua New Guinea Medical Journal 28: 67-72.

1986 Primary Health Care and Local Self-Determination: Policy Implications from Rural Papua New Guinea. Human Organization 45(2): 103-112.

1987 Multinational Development and Customary Land Tenure: The Ok Tedi Project of Papua New Guinea. The Journal of Anthropology 6(2): 109-132.

1988 Primary Health Care: A Papua New Guinea Example. Cultural Survival Quarterly 12(1): 1-4.

1988 (with A. F. Afdhal) The Rise of the Modern Jamu Industry in Indonesia: A Preliminary Overview. Pp. 149-172, In: S. van der Geest and S.R. White, (eds.), The Context of Medicines in Developing Countries: Studies in Pharmaceutical Anthropology. Dordrecht: Kluwer Academic Publishers.

1990 (with J. Terrell) Trade Networks, Areal Integration, and Diversity along the North Coast of New Guinea. Asian Perspectives 29: 156-165.

1991 Traditional Medicine and Western Medical Options among the Ningerum of Papua New Guinea. In: L. Romanucci-Ross, D. Moerman & L. Tancredi, eds., The Anthropology of Medicine: From Culture to Method, pp. 32-55. Second Edition. New York: Bergin & Garvey.

1991 (with J. Terrell) Continuity and Change in Economic Relations Along the Aitape Coast of Papua New Guinea, 1909—1990. Pacific Studies 14(4): 113-128.

1992 (with J. Terrell, and J. A. Nadolski) Language and Culture on the North Coast of New Guinea. American Anthropologist 94(3): 568-600.

CCUC, PUBLICATIONS, 1993

(publications with 1993 dates—excluding abstracts)

DEPARTMENT OF ANTHROPOLOGY

Catherine Anderson

The Care of Architectural Collections. Cultural Resources Management Bulletin U.S. Department of Interior, National Park Service, p. 12-13.

Bennet Bronson

Against Migration: A Negative Perspective on Population Movements in Prehistoric Southeast Asia. Philippine Quarterly of Culture and Society 20(4): 241-257.

Foreword. In: Lynda Reyes, Textiles of the Southern Philippines 3 pp.

Winifred Creamer

Review of Columbian Consequences: The Spanish Borderlands in Panamerican Perspective, edited by David H. Thomas. Washington, D.C.: Smithsonian Institution Press. Latin American Antiquity 4(1): 94-95.

Review of Wealth and Hierarchy in the Intermediate Area, edited by Frederick W. Lange. Washington, D.C.: Dumbarton Oaks. Science 260: 245-247.

(with J. Haas) Review of The Ancient Americas: Art from Sacred Landscapes, Chicago: Art Institute of Chicago, including both the publication and the exhibit. Museum Anthropology 17: 80-85.

(with J. Haas) Stress and Warfare Among the Kayenta Anasazi of the 13th Century A.D. Fieldiana, Anthropology, n.s. 21: 1-211.

The Architecture of the Arroyo Hondo, New Mexico. Sante Fe: School of American Research Press.

Jonathan Haas

(with W. Creamer) Stress and Warfare Among the Kayenta Anasazi of the 13th Century A.D. Fieldiana, Anthropology, n.s. 21: 1-211.

Repatriation in a Global Context for Natural History Museums. Pp. 71-81 In: C. Rose, S. Williams and J. Gisbert (eds.), Current Issues, Initiatives, and Future Directions for the Preservation and Conservation of Natural History Collections, Volume 3. Proceedings of the International Symposium and First World Congress on the Preservation and Conservation of Natural History Collections, Madrid.

(with W. Creamer) Review of "Ancient Americas" travelling exhibit. Museum Anthropology 17(3): 80-95.

Chuimei Ho

Japanese Lacquerware: Top Japanese Imports of the 17th Century. In the Field, July/August, pp.1, 10-11, Chicago.

Janice B. Klein

A Preliminary Guide to NAGPRA. Registrar's Newsletter 1(2): 12-14.

Phillip Lewis

The Future of New Ireland Art. Pp. 197-205, In Philip J. C. Dark and Roger C. Rose (eds.), Artistic Heritage in a Changing Pacific. Honolulu: University of Hawaii Press.

David S. Reese

Animal Bones. Pp. 91-95, In: R. Leighton (ed.), The Cittadella in the Protohistoric Period (Morgantina Studies IV). Princeton: Princeton University Press.

Faunal Remains from the Well. Pp. 301-302, In: V. R. Anderson-Stojanovi (ed.), A Well in the Rachi Settlement at Isthmia. Hesperia 62(3).

Folklore and Fossil Bones: The Pygmy Mammals of Cyprus. Terra Nova 42(3): 319-321.

Marine Shells. Pp. 207-209, In: L. Wriedt Sørensen and D. W. Rupp (eds.), The Land of the Paphian Aphrodite 2 The Canadian Palaipaphos Survey Project. Artifact and Ecofaunal Studies. SIMA CIV:2. Göteborg: Paul Åströms Förlag.

(with C. Sease) Some Previously Unpublished Engraved Tridacna Shells. Journal of Near Eastern Studies 52(2): 109-128.

(with A. H. Simmons) Hippo Hunters of Akrotiri. Archaeology 46(5): 40-43.

The Earliest Worked Bone on Cyprus. Report of the Department of Antiquities Cyprus, 1992, 13-16.

Fauna from the Poros Tomb. Appendix G in P. Muhly. Minoikos Laetettos Tafos ston Poro Herakleio (Anaskafis 1967). Athens, 180-181.

Shells and Animal Bones. In V. Karageorghis, O. Picard, and C. Tytgat, eds., La Nécropole d'Amathonte Tombes 113-367 VI (Études Chypriotes XIV). Nicosia: A. G. Leventis Foundation, 123-14.

Recent and Fossil Marine Invertebrates. Pp. 493-496, Appendix 2, In: L. H. Sackett (ed.), Knossos, From Greek City to Roman Colony. Excavations at the Unexplored Mansion II. British School of Archaeology at Athens Suppl. vol. 21. Oxford: Thames and Hudson, 493-496.

The Marine and Fresh-water Shells. Pp. 347-352, Chapter 14, In: F. D'Andria and D. Whitehouse, eds., Excavations at Otranto II The Finds. Galatina (Lecce): Congedo Editore.

Shells from the Hoard at Khirbet Karhasan (Iraq). Appendix A in D. Tucker, A Middle Assyrian Hoard from Khirbet Karhasan, Iraq. Iraq 54: 178-179.

Anna C. Roosevelt

The Rise and Fall of the Amazon Chiefdoms. Pp. 255-284, In: A.-C. Taylor and P. Descola (eds.), Le Remontée de L'Amazonie: Anthropologie et Histoire des Sociétés Amazoniennes, L'Homme 33 (126-128), Special Issue. Paris.

Rethinking Native Amazonia. Edited Volume from the Wenner-Gren International Symposium. Tuscon: University of Arizona Press.

Catherine Sease

Light Piping: A New Lighting System for Museum Cases. Journal of the American Institute for Conservation 32(3): 279-290.

(with D. Reese) Some Previously Unpublished Engraved Tridacna Shells. Journal of Near Eastern Studies 52(2): 109-128.

Review. "Saving the Past from the Future: Archaeological Curation in the St. Louis District", by Michael K. Trimble and Thomas B. Meyers, Illinois Archaeology 4(1): 86-87

(with David S. Reese) Some Previously Unpublished Engraved Tridacna Shells. Journal of Near Eastern Studies 52(2): 109-128.

Charles S. Stanish

(with E. de la Vega M. & K. L. Frye) Domestic Architecture of Lupaqa Area Sites. Pp. 1-12, In: M. Aldenderfer (ed.), Domestic Architecture in South Central Andean Prehistory. University of Iowa Press.

(with M. Aldenderfer) Domestic Architecture, Household and the Past in the South-Central Andes. Pp. 83-94, In: M. Aldenderfer (ed.), Domestic Architecture in South Central Andean Prehistory. University of Iowa Press.

John Terrell

Regional Studies in Anthropology: A Melanesian Prospectus. Current Anthropology 34(2): 177-179.

Pacific prehistory as a work of art. Pp. 20-24, In: P. J. C. Dark and R. G. Rose (eds.), Artistic Heritage in a Changing Pacific. Proceedings of the 4th International Symposium on the Arts of the Pacific. Honolulu: University of Hawaii Press.

Building a Pole House. Fine Homebuilding 83: 77-79.

James VanStone

Material Culture of the Chilcotin Athapaskans of West Central British Columbia: Collections in the Field Museum of Natural History. Fieldiana, Anthropology, n.s. 20: 1-29.

The Ainu Group at the Louisiana Purchase Exposition, 1904. Arctic Anthropology 30(2): 77-91.

Robert L. Welsch

Captain Cook's Voyages of Discovery. Originally compiled by John Barrow, and published 1860, with a new introduction by Robert L. Welsch (ed.). Chicago: Academy Chicago.

Review of Mining, Politics, and Development in the South Pacific, by Michael C. Howard. American Anthropologist 95(2): 450-451.

CCUC, ACTIVE GRANTS, 1993

DEPARTMENT OF ANTHROPOLOGY

Bennet Bronson

National Endowment for the Humanities: "Upgrade of the Anthropological Storage Facilities" \$783,310 PH-20508-92 (1992-1997), (with J. Haas and C. Sease).

Jonathan Haas

National Endowment for the Humanities: "Upgrade of the Anthropological Storage Facilities" \$783,310 PH-20508-92 (1992-1997), (with B. Bronson and C. Sease).

National Science Foundation: "Support for the Primate Facility at Field Museum of Natural History" \$25,537 BNS-9204356 (1992-1994), (with B. Patterson and J. Fooden).

USDA Forest Service: "NAGPRA Cost Share Agreement" \$5,998 (1993-1994), (with J. Klein).

Janice B. Klein

USDA Forest Service: "NAGPRA Cost Share Agreement" \$5,998 (1993-1994), (with J. Haas).

Chumei Ho

National Academy of Science: "Committee on Scholarly Communication with China" Conference Grant, \$650 (1993).

David S. Reese

NSF/NATO: "Analysis of circum-Mediterranean bioarchaeological material now stored in Utrecht, Amsterdam, Leiden, and Groningen, the Netherlands" \$30,525 (1992-1993).

Anna Roosevelt

National Endowment for the Humanities: "The Development Sequence at Santarem on the Lower Amazon, Brazil" \$250,000 RO-22319 (1991-1993).

Catherine Sease

National Endowment for the Humanities: "Upgrade of the Anthropological Storage Facilities" \$783,310 PH-20508-92 (1992-1997), (with J. Haas and B. Bronson).

National Endowment for the Arts: "Post-graduate Internship Program in the Conservation of Ethnographic Works of Art" \$20,000 91-4431-0162 (1992-1993).

Charles S. Stanish

National Science Foundation: "Secondary State Formation in the Lupaqa Area, Lake Titicaca, Peru" \$19,180 DBS-9307784 (1993-1994).

John Terrell

National Endowment for the Humanities: "Continuity and Change in Exchange Relations on the Aitape Coast of Papua New Guinea" \$69,950 RO-22203-91 (1991-1994), (with R. Welsch).

National Science Foundation: "Exchange Networks on the North Coast of New Guinea: Collaborative Field Studies and Historical Research Using American and German Museum Collections" \$71,836 DBS-9120301 (1992-1994), (with R. Welsch).

Robert Welsch

National Endowment for the Humanities: "Continuity and Change in Exchange Relations on the Aitape Coast of Papua New Guinea" \$69,950 RO-22203-91 (1992-1994), (with J. Terrell).

National Science Foundation: "Exchange Networks on the North Coast of New Guinea: Collaborative Field Studies and Historical Research Using American and German Museum Collections" \$71,836 DBS-9120301 (1992-1994), (with J. Terrell).

**CCUC, MUSEUM AND PUBLIC SERVICE, 1993
(EDITORSHIPS, COMMITTEES ETC.)**

(excluding ad hoc reviews, committee alternates)

DEPARTMENT OF ANTHROPOLOGY

Bennet Bronson

Editorial Board, Archeomaterials; Chair, Field Museum Department of Anthropology; Member, Field Museum Collections Advisory Committee; Museum Representative, Field Museum Collections Committee.

Winifred Creamer

Executive Director, Anthropology Museum, Northern Illinois University.

Christine Del Re

Coordinator of the Ethnographic Working Group of the Conservation Committee of the International Council of Museums; Consultant: Kalamazoo Public Museum, Kalamazoo, Michigan; Tinbei Swiss Cottage Museum, Rockford, Illinois; Lake County Museum, Wauconda, Illinois; Milwaukee Art Museum, Milwaukee, Wisconsin.

Christine Gross

Member, Field Museum Disaster Preparedness Committee; Member, Field Museum Anthropology Department Collections Management Procedures Committee; Member, Field Museum Disaster Preparedness Committee; Member, Field Museum Public Education Task Force.

Jonathan Haas

Review Committee, Native American Graves Protection and Repatriation Act; Executive Committee, Association of Systematic Collections; Advisory Board, Chicago Area Fulbright Scholar Program, Council for International Exchange of Scholars; Member, Committee on Museums and Native American Collaboration, American Association of Museums; Member, Host Committee, Parliament of World Religions; Chair, Field Museum Collections Advisory Council; Member, Field Museum Special Exhibits Committee; Member, Field Museum Research Advisory Council; Member, Field Museum Public Learning Advisory Council; Development Team, Living Together in Chicago Exhibit.

Sheryl Heidenreich

Member, Field Museum Space Committee.

Chuimei Ho

Collection Committee, Museum of Art, Beloit College; Executive Committee, Chinese Ancient Ceramic Society, China; Vice-Chairman, Committee for Friends of the Museum, Dehua Ceramic Museum.

Janice B. Klein

Member, Field Museum Collections Advisory Council; Member, Field Museum Repatriation Guidelines Task Force; Chair, Field Museum IMS Survey Task Force; Member, Field Museum Kaffeeklatsch; Treasurer, Registrar's Committee of the American Association of Museums; Director-at-Large, Association of Illinois Museums; AAM MAP II Surveyor; Member, PACIN Board, RC-AAM; Member, SPNHC Organizer, Sessional Committee on Common Philosophies and Objectives; Member, Chicago Area Registrars Council.

Anna C. Roosevelt

Editorial Consultant, Latin American Antiquity; Advisory Board, Wenner-Gren Foundation for Anthropological Research; Governing Board, American Anthropological Association; Executive Committee, General Anthropology Division of the American Anthropological Association; Environment Task Force, American Anthropological Association; Anthropology Board of Directors, American Association for the Advancement of Science; Officer, New York Academy of Sciences; Board of Directors and Executive Committee, Latin American Scholarship Program in American Universities; Member, Field Museum Research Advisory Council.

Catherine Sease

Consultant, Los Angeles County Museum of Natural History; Member, Field Museum IMS Survey Task Force; Consultant, Kampsville Archaeological Museum; Member, Field Museum Disaster Preparedness Committee; Member, Field Museum Safety and Security Committee; Associate Editor, Journal of American Institute for Conservation; Consultant, Museum of Natural History, University of Illinois, Urbana; Reviewer, National Science Foundation.

Charles S. Stanish

Editorial Board Member, South America, Prehistory Press; Vice President, Chicago Archaeological Society; Book Review Editor, Latin American Antiquity; Advisor, Peruvian Art Society; Antiquities Consultant, United States Customs Service; Vice-Chair, Field Museum Department of Anthropology; Member, Field Museum Collections Advisory Council.

John Terrell

Fellow, American Anthropological Association; Board Member, Council for Museum Anthropology; Member, Scholarship Committee; Member, Science Advisory Council.

James VanStone

Advisory Board, Mitchell Museum.

CCUC, SCIENTIFIC TRAVEL, 1993

DEPARTMENT OF ANTHROPOLOGY

Catherine Anderson

Mt. Carroll, Illinois, seminars, Campbell Center for Historic Preservation.

Bennet Bronson

Washington, DC, National Endowment for the Humanities Panel Meetings; Decatur, Illinois, seminar, Milliken University; Beloit, Wisconsin, collections consultant, Beloit College Museum; Washington, D.C., American Anthropological Association.

Winifred Creamer

Northern New Mexico, fieldwork; St. Louis, Missouri, Society for American Archaeology meeting; Washington, D.C., American Anthropological Association.

Christine Del Re

Washington DC, International Council of Museums Meetings; Washington DC, research, National Museum of Natural History, National Museum of American History, Freer Gallery of Art, Museum Support Center; Mt. Carroll, Illinois, seminars, Campbell Center for Historic Preservation; Shawnee, Oklahoma, seminar.

William Grewe-Mullins

Victoria, British Columbia, Society for the Preservation of Natural History Collections Annual Meetings.

Christine Gross

Fort Worth, Texas, American Association of Museums Annual Meeting.

Chuimei Ho

Tokyo, Japan, annual meeting of the Japan Society for the Study of Oriental Trade Ceramics, Aoyama University; Dehua, China, annual meeting of the Chinese Ancient Ceramic Society, Dehua Ceramic Museum; Zhejiang, China, study tour asian ceramics; Trowulan, Indonesia, Indonesian Field School of Archaeology; Jakarta, Indonesia, National Archaeology Research Centre; Singapore, National Museum and Fort Canning Archaeological Research Centre.

Janice B. Klein

Philadelphia, Pennsylvania, course, ALI-ABA; Fort Worth, Texas, American Association of Museums Annual Meeting; St. Louis, Missouri, Midwest Museums Conference Meeting; Muncie, Indiana, Woodlands Indians Workshop; Cincinnati, Ohio, Repatriation Meeting, Cincinnati Art Museum and Cincinnati Museum of Natural History.

Jonathan Haas

Boston, Massachusetts, American Association for the Advancement of Science; Honolulu, Hawaii, Review Committee for Native American Graves Protection and Repatriation Act; Santa Fe, New Mexico, Science Advisory Board of the Santa Fe Institute; Washington, D.C., House Committee on Interior Appropriations Hearings; St. Louis, Missouri, Society for American Archaeology; Washington, D.C., Senate Committee on Indian Affairs; Ft. Worth, Texas, American Association of Museums Annual Meeting; Indianapolis, Indiana, Indian Market at Eiteljorg Museum; Santa Fe, New Mexico, External Faculty of the Santa Fe Institute; New Mexico, Archaeological Field Survey; Santa Fe, New Mexico, Indian Market of the Southwest Indian Arts Association; Washington, D.C., Native American Graves Protection and Repatriation Act; Santa Fe, New Mexico, Conference on the Evolution of Cultural Systems at the Santa Fe Institute; Washington, D.C., American Anthropological Association.

Anna C. Roosevelt

Boston, Massachusetts, American Association for the Advancement of Science Annual Meeting; New Orleans, Louisiana, lectures, Tulane University; Middleburg, Virginia, lecture, Foxcroft School; Denver, Colorado, lecture, Denver Museum of Fine Arts; Urbana, Illinois, Midwest Mesoamerican Archaeology Meeting, University of Illinois at Urbana; St. Louis, Missouri, Society for American Archaeology Annual Meeting; New York, New York, meeting, Advisory Board Wenner-Gren Foundation for Anthropological Research; New York, New York, research, Museum of the American Indian; Philadelphia, Pennsylvania, research, University Museum; Venezuela, meeting; Santarem Brazil, fieldwork.

Catherine Sease

Morgantina, Aidone, Sicily, Italy, fieldwork; Carthage, Tunis, Tunisia, conservation consulting; London, England, Conservation and the Antiquities Trade Conference; Denver, Colorado, American Institute for Conservation Meetings; Mt. Carroll, Illinois, seminars, Campbell Center for Historic Preservation.

Charles S. Stanish

Juli, Peru, fieldwork, Proyecto Lupaqa; St. Louis, Missouri, Society for American Archaeology Meeting; Pittsburgh, Pennsylvania, Northeast Conference of Andean Archaeology and Ethnohistory; St. Louis, Missouri, Midwest Conference on Andean Archeology.

John Terrell

Hilo, Hawaii, Association for Social Anthropology Oceania Meetings; Aitape District, West Sepik (Sandaun) Province, Papua New Guinea, fieldwork.

James VanStone

Evanston, Illinois, meeting, Advisory Board of the Mitchell Museum; Anchorage, Alaska, Alaska Anthropological Association Meetings; Omaha, Nebraska, Consultant, Jocelyn Art Museum.

Robert Welsch

Papua New Guinea, fieldwork.

CCUC, CONTRIBUTIONS TO PUBLIC LEARNING, I, 1993
(EXHIBITS, INFORMAL EDUCATION, SEMINARS, ETC.)

DEPARTMENT OF ANTHROPOLOGY

Catherine Anderson

Exhibit Development: Conservation Services, Maori Meeting House.

Bennet Bronson

Exhibit Development: New Accessions Display in North Lounge; Center for Cultural Understanding and Change Exhibit; Content Specialist, Tibet Renovation; Content Specialist, Africa; Content Specialist, China Reinstallation.

Education Programs: Member's Night; Artifact ID Day; Indonesia Day; Parliament of World Religions.

Tours, etc.: Indiana University-Purdue University at Indianapolis Anthropology Club; American and Japanese Businessmen; Midwest Japan Seminar; Northern Illinois University Department of Art; Beloit College Museums Group; Essex China Tour; Illinois Institute of Technology College of Architecture group; Indonesian Consulate; School of the Art Institute; Roosevelt University English Department.

Seminars and Other Presentations: Field Museum Collections Committee; Milliken University, Decatur, Illinois.

Winifred Creamer

Education Programs: Member's Night, Celebración 93.

Seminars and Other Presentations: NIU Alumni lecture/tour of North American halls at Field Museum; Chicago Archaeological Society; SAA Meeting, St. Louis, Missouri.

Christine Del Re

Exhibit Development: Conservation Services, Tibet Renovation; Conservation Services, Pacific Revisions.

Seminars and Other Presentations: Field Museum Collector's Committee; Campbell Center for Historic Preservation, Mt. Carroll, Illinois; seminar, Shawnee, Oklahoma.

James Foerster

Education Programs: Member's Night; Parliament of World Religions.

William Grewe-Mullins

Exhibit Development: Support Services, New Accessions Display in North Lounge; Maori House; Tibet Renovation; Africa; Hall 2; Center for Cultural Understanding and Change Exhibit.

Education Programs: Member's Night.

Tours, etc.: Association of Midwest Colleges; Beloit College Museum Studies Program; Chicago Public School Teachers Group; Friends of Franklin Society.

Christine Gross

Exhibit Development: Support Services, New Accessions Display in North Lounge; Maori House; Tibet Renovation; Africa; Hall 2; Pacific Revisions; Center for Cultural Understanding and Change Exhibit.

Education Programs: Member's Night.

Seminars and Other Presentations: Lectures, University of Illinois at Chicago, Loyola University.

Tours, etc.: Miami University Student Group; NAES College Students; Archaeological Institute of America Chicago Chapter; Association of Midwest Colleges; Beloit College Museum Studies Program; William H. Ray Elementary School Group; Native American Group.

Jonathan Haas

Exhibit Development: Center for Cultural Understanding and Change Exhibit; Living Together in Chicago Exhibit; Africa; Maori House; Hopi Exhibit.

Education Programs: Member's Night; Parliament of World Religions.

Seminars and Other Presentations: Multiple Presentations, Chicago-area Grade Schools.

Tours, etc.: Arapaho Tribal Council Group; Representatives of the Navaho Tribe.

Sheryl Heidenreich

Education Programs: Member's Night.

Chuimei Ho

Exhibit Development: Support Services, "The Last Emperor"; Support Services Taejon International Exhibit, Korea.

Janice B. Klein

Exhibit Development: Support Services, Africa, Maori House.

Education Programs: Member's Night.

Seminars and Other Presentations: Survey, DuSable Museum; American Association of Museums Meeting, Fort Worth, Texas; Midwest Museums Conference Meeting, St. Louis, Missouri; Survey, Fort Mackinac Historic Park.

Phillip H. Lewis

Exhibit Development: Content Specialist, Africa.

Wendy Morton

Exhibit Development: Conservation Services, Animal Kingdom; Africa.

Julie Pitzen

Education Programs: Parliament of World Religions; Member's Night.

Karen Poulson

Education Programs: Member's Night.

Lisa Renken

Education Programs: Field Museum Latin American Celebración.

Loran Recchia

Education Programs: Member's Night.

Anna C. Roosevelt

Education Programs: Member's Night.

Seminars and Other Presentations: American Association for the Advancement of Science Annual Meeting, Boston, Massachusetts; Tulane University, New Orleans, Louisiana; Foxcroft School, Middleburg, Virginia; Denver Museum of Fine Arts, Denver, Colorado; Midwest Mesoamerican Archaeology Meeting, Urbana, Illinois; Society for American Archaeology Annual Meeting, St. Louis, Missouri.

Catherine Sease

Exhibit Development: Conservation Consultant, Africa; Tibet Renovation; Maori House; Te Waka Toi Traveling Exhibit.

Seminars and Other Presentations: DePaul Law School; Conservation and the Antiquities Trade Conference, London, England; Campbell Center for Historic Preservation, Mt. Carroll, Illinois.

Charles S. Stanish

Education Programs: Member's Night, Artifact ID Day.

Seminars and Other Presentations: Society for American Archaeology Meeting, St. Louis, Missouri; Northeast Conference of Andean Archaeology and Ethnohistory, Pittsburgh, Pennsylvania; Midwest Conference on Andean Archeology, St. Louis, Missouri; Field Museum Department of Education students; University of Chicago; Academy of Sciences.

Tours, etc.: Field Museum Tour, Central America.

John Terrell

Exhibit Development: Content Specialist, Maori House; Content Specialist, Pacific Renovations.

Education Programs: Training of Moari House Docents.

James VanStone

Education Programs: Member's Night.

Seminars and Other Presentations: Field Museum Education Volunteers.

Tours, etc.: Field Museum Women's Board.

Robert L. Welsch

Seminars and other Presentations: Association for the Social Anthropology of Asia, Kona, Hawaii; National Museum and Art Gallery, Port Moresby, Papua New Guinea; Lecture Series, St. Ignacius High School, Aitape, West Sepik Province, Papua New Guinea; Lecture Series, Tarawai Community Schools, East Sepik Province, Papua New Guinea; Lecture Series, Ali Community Schools, West Sepik Province, Papua New Guinea.

CCUC, CONTRIBUTIONS TO PUBLIC LEARNING, II, 1993
(UNIVERSITY/HIGH SCHOOL EDUCATION)

DEPARTMENT OF ANTHROPOLOGY

Bennet Bronson

Interns: John Dahlberg, Northern Illinois University; Angela Hong, Illinois Math and Science Academy; David Menke, University of Chicago; Melanie Okamoto, University of Chicago.

Graduate Students Advised: Alexandra Greene, Northern Illinois University/University of London.

Winifred Creamer

Courses: Archaeological Analysis, North American Indians, Northern Illinois University.

Interns: Ian Gordon, University of Chicago; Karrie Brace, Northern Illinois University; Patricia Hamlen, Northern Illinois University.

Postdoctoral Associates: Lisa Renken

Christine Gross

Interns: Colleen Goldsborough, Beloit College; Judith Strazewski, School of the Art Institute; Jo Ann Tan, School of the Art Institute; Nancy Whitney, School of the Art Institute.

Graduate Students Advised: Linda Anderson, Marshall University; David Wells, School of the Art Institute.

Jonathan Haas

Courses: Museum Anthropology, University of Illinois at Chicago.

Interns: Ian Gordon, University of Chicago.

Graduate Students Advised: David Kice, University of Chicago; Karen Poulson, University of Illinois at Chicago.

Postdoctoral Associates: Lisa Renken, James Carucci.

Janice Klein

Interns: Justine Buck, University of Chicago; Linda Burns, University of Chicago; Jeffrey Gibson, School of the Art Institute; Rebecca Hammond, Field Museum Native American Intern; Jane Levin, University of Illinois at Chicago; Patricia Michaels, School of the Art Institute; Martina Nehrling, School of the Art Institute.

Anna C. Roosevelt

Courses: Anthropology, University of Illinois at Chicago.

Interns: Marilyn Cosentino, University of Illinois at Chicago; David Lomelino, University of Illinois at Chicago; Gabrielle Powell, School of the Art Institute of Chicago; Ellen Quinn, University of Illinois at Chicago.

Graduate Students Advised: Susan Swales, University of Illinois at Chicago.

Catherine Sease

Interns: Susana Zubiate.

Charles S. Stanish

Courses: Introduction to Latin American Civilization, University of Illinois at Chicago.

Graduate Students Advised: Asunción Bordach, University of Chicago; Peter Burgi, University of Chicago; John Janesek, University of Chicago; James Matthews, University of Chicago; Matthew Seddon, University of Chicago; Cheryl Sutherland, University of Chicago; Ann Webster, University of Chicago.

John Terrell

Courses: Museum Anthropology, University of Illinois at Chicago.

Robert L. Welsch

Courses: Independant Research for students in Department of Anthropology, University of Papua New Guinea, fieldwork in Aitape and West Sepik Provinces.

CCUC, UNDERGRADUATE INTERNS, 1993

School of the Art Institute Interns

Jeffrey Gibson, Patricia Michaels, Martina Nehrling, Judith Strazewski, JoAnn Tan, Nancy Whitney

Field Museum Scholarship Program Intern

Ian Gordon, University of Chicago

Field Museum Native American Intern Program

Rebecca Hammond, Michael Tsosie

Others

Justine Buck, University of Chicago; Linda Burns, University of Chicago; John Dahlberg, Northern Illinois University; Colleen Goldsborough, Beloit College; Jane Levin, University of Illinois at Chicago; David Menke, University of Chicago; Melanie Okamoto, University of Chicago; Susana Zubiate, Post-graduate intern

High School Interns

Angela Hong, Illinois Math and Science Academy

CCUC, VOLUNTEERS, 1993

Dorothy Baumgarten, Garland Brown, Peter Buol, Sol Century, Peter Coey, Connie Crane, John Dahlberg, Paul DuBrow, Gail Eby, Hershey Escudero, Jack Ewing, Melinda Gallo, Peter Gayford, Patricia Gibbons, Margaret Goes, Robert Gowland, Thomas Grygiel, Patricia Hamlen, Kyoko Iida, Tomoki Imai, Belen Jaquez, Elizabeth Klarich, Betty Lewis, Valerie Lewis, Jack MacDonald, Melissa Martens, Carolyn Moore, George Morse, Dorothea Phipps-Cruz, Julie Pitzen, Anthony Rieck, Kathryn Saliba, Ika Tomaschewsky, Satomi Uenishi, Wang-Fai Wong, Edward Yastrow, Tomomi Yoshimizu

CCUC, VISITING SCIENTISTS, 1993

Ethne Barnes, Professor, Wichita State University
Suzanne Baylor, Graduate Student, Northern Illinois University
Lisbet Bengtsson, University of Illinois at Urbana, Champaign
Yuri Berezkin, Institute for the Study of Material Culture, St. Petersburg
Chau Hingwah, Assistant Curator of Archaeology, Hong Kong Museum of History
Lee Davis, Research Associate, Newberry Library
Judith Habicht-Mauche, Professor, University of California-Santa Cruz
Ivan Hinojosa, Graduate Student, University of Chicago
Isabel Iriarte, Assistant Professor, University of Buenos Aires
Carolyn Johnson, Graduate Student, University of Chicago
Heide Leigh-Thisen, Curator, Museum für Volkerkunde, Vienna
Elizabeth Lillehoj, Assistant Professor, DePaul University
Ellen Steinberg, Graduate Student, University of Illinois at Chicago
Michael Joseph Rizo, Graduate Student, Department of Anthropology, Arizona State University
Tina Stenson, Graduate Student, University of Illinois at Chicago
Sam Stepanovich, Graduate Student, University of Illinois at Chicago
Christopher Vinyard, Graduate Student, Northern Illinois University
Karen Weinstein, Graduate Student, University of Illinois at Chicago
Prabowo Woerjadi, Diplomat, Indonesian Consulate-Chicago
Ari Zighelboim, Graduate Student, University of Illinois at Urbana, Champaign

DEPARTMENT OF ANTHROPOLOGY

Research Associates

Dean E. Arnold, Ph.D., Mesoamerican and South American Archaeology and Ethnology
Philip J. Arnold III, Ph.D., Mesoamerican Archaeology, Craft Production and Ethnoarchaeology
Brian Bauer, Ph.D., Andean Archaeology
Lane Anderson Beck, Ph.D., Bioarchaeology, Mortuary Analysis, Paleopathology, Paleonutrition, Museum Systems
Robert J. Braidwood, Ph.D., Middle Eastern Archaeology
James A. Brown, Ph.D., North American Archaeology
Jane E. Buikstra, Ph.D., Skeletal Biology, Paleopathology, Paleodemography, Forensic Anthropology, Mortuary Site Archaeology; North America, Peru
Patrick H. Carmichael, Ph.D., South American Archaeology and Ethnology
Phillip J.C. Dark, Ph.D., African Ethnology
Jack L. Davis, Ph.D., Mediterranean Archaeology
Raymond J. DeMallie, Ph.D., Kinship, Symbolic Anthropology, Ethnohistory, History of Anthropology; North America
Richard De Puma, Ph.D., Etruscan Archaeology
Robert Feldman, Ph.D., Andean Archaeology
Paul Goldstein, Ph.D., South American Archaeology
Robert L. Hall, Ph.D., Plains and Midwestern Archaeology and Ethnology
Chuimei Ho, Ph.D., East and Southeast Asian Archaeology and Art History
Paul Hockings, Ph.D., Southern Asian Social Anthropology
Bill Holm, M.F.A., Northwest Coast Art and Material Culture
F. Clark Howell, Ph.D., Old World Prehistory
Lawrence H. Keeley, Ph.D., Europe and North American Paleolithic Archaeology
Maxine Kleindeinst, Ph.D., Old World Prehistory
Alan L. Kolata, Ph.D., Andean Archaeology and Ethnohistory
Lyle Konigsberg, Ph.D., Physical Anthropology
Charles E. Lincoln, Ph.D., Mesoamerican Archaeology
Donald E. McVicker, Ph.D., Mesoamerican archaeology
Michael E. Moseley, Ph.D., South American Archaeology
Charles E. Orser, Jr., Ph.D., Historical Archaeology, Ethnohistory, Archaeological Theory; Eastern U.S., Brazil, Portugal
Douglas W. Owsley, Ph.D., Physical Anthropology
James L. Phillips, Ph.D., Old World Prehistory, Epipaleolithic Typology and Technology
Robert B. Pickering, Ph.D., Physical Anthropology
Jack H. Prost, Ph.D., Physical Anthropology and Primate Behavior
George I. Quimby, M.A., Museology and North American Culture History
David S. Reese, Ph.D., Archaeozoology and Paleomalacology
Johan G. Reinhard, Ph.D., Nepal, Bolivia, Peru
Mario Rivera, Ph.D., South American Archaeology
Fred H. Smith, Ph.D., Physical Anthropology
Gil J. Stein, Ph.D., Middle Eastern Archaeology, Complex Societies
Robin Torrence, Ph.D., Aegean and Pacific Archaeology and Ethnohistory
Patricia Wattenmaker, Ph.D., Middle Eastern Archaeology
Ronald Weber, Ph.D., Amazon Basin and Northwest Coast Archaeology and Ethnology

Associates

Eloise Richards Barter, M.A., North American Ethnography
Dorothy Baumgarten, A.A., Asian Material Culture
Louva Calhoun, B.F.A., Anthropology
Sol Century, B.S., Asian Material Culture
William J. Conklin, M.A., Peruvian Architecture and Textiles
Connie Crane, A.B., North American Ethnology
Patricia Dodson, M.A., Latin American Archaeology and Ethnology
Jane Levin, B.S., North American Archaeology
Elena Kourembana Lincoln, M.A., Mayan Archaeology
Carolyn Moore, B.A., Associate for the Asian Collection
Charles R. Ortloff, M.Ae.E., Peruvian Archaeology
Llois Stein, Associate for the Pacific Collection

CCUC, COLLECTION STATISTICS, 1993

ANTHROPOLOGY COLLECTION SIZE AND GROWTH

Collection	1992—No. of Specimens	1993—No. of Specimens	1992-1993 % growth
AFRICA			
Sub-Saharan, History-Ethnograph			
Cameroon, Nigeria and West Africa	5,296	5,307	0.20
Benin bronzes	104	104	0
Angola and Zaire	850	850	0
East and South	3,780	3,780	0
Madagascar, History-Ethnography	3,770	3,770	0
Egypt, Archaeology	2,820	2,820	0
Coptic textiles	670	670	0
General, Prehistoric Archaeology	141,940	141,940	0
General and Other, History-Ethnography	1,600	1,603	0.19
TOTAL AFRICA	160,830	160,844	0.009
EUROPE			
Italy, Archaeology			
Etruscan	280	280	0
Roman and Graeco-Roman	1,080	1,080	0
Pompeii	200	200	0
Other, Archaeology and History-Ethnography	120	120	0
General, Prehistoric Archaeology	45,700	45,700	0
TOTAL EUROPE	47,180	47,180	0
ASIA			
East Asia, Archaeology and History-Ethnography			
China,	15,500	15,638	0.67
Rubblings	5,000	5,000	0
Textiles	3,000	3,000	0
Tibet	4,400	4,400	0
Japan	3,630	3,830	5.51
Sword furniture	1,060	1,060	0
Other (Korea, Siberia, etc.)	700	701	0.14
Southeast, History-Ethnography			
Philippines	9,150	9,151	0.01
Indonesia-Malaysia	6,460	6,460	0
Mainland			
Burma	240	240	0
Thailand	130	130	0
South, Archaeology and History-Ethnography			
India, Nepal, Bangladesh	2,420	2,420	0
Sri Lanka	430	430	0
Pakistan and Afghanistan	810	810	0
Middle East			
Iran and Jordan, Archaeology	300	300	0
Iraq, Archaeology	31,500	31,500	0
General Ethnography	100	100	0
Other (Central, West)	100	100	0
TOTAL ASIA	84,930	85,290	0.42

CCUC, COLLECTIONS STATISTICS, 1993

ANTHROPOLOGY COLLECTION SIZE AND GROWTH (cont.)

Collection	1992—No. of Specimens	1993—No. of Specimens	1992-1993 % growth
SOUTH AMERICA			
Andean Area, Archaeology	16,900	16,900	0
Andean Area, History-Ethnography	680	695	2.21
Amazonia and Marginal, History Ethnography	5,410	5,410	0
General, History—Ethnography	50	50	0
TOTAL SOUTH AMERICA	23,040	23,055	0.07
CENTRAL AND MIDDLE AMERICA			
Mainland, Archaeology	10,600	10,600	0
Mainland, History-Ethnography	2,720	2,720	0
Caribbean, History-Ethnography	950	954	0.42
TOTAL SOUTH AMERICA	14,270	14,274	0.03
NORTH AMERICA			
Arctic, History-Ethnography	4,800	4,895	1.98
Northwest Coast, History-Ethnography	6,950	6,952	0.03
California, History-Ethnography	4,350	4,355	0.11
Plains and Basin, History-Ethnography	15,030	15,154	0.83
Southwest, History-Ethnography	5,560	5,596	0.65
East and Central, History-Ethnography	3,180	3,207	0.85
General, History-Ethnography	150	150	0
Southwest and Central, Archaeology	185,000	185,000	0
TOTAL NORTH AMERICA	225,020	225,309	0.13
PACIFIC			
Australia, History-Ethnography	1,560	1,561	0.06
New Guinea, History-Ethnography	14,950	14,971	0.14
Melanesia, History-Ethnography	14,900	14,901	0.006
Polynesia, History-Ethnography	5,190	5,256	1.27
Micronesia, Archaeology & History-Ethnography	11,270	11,270	0
General, History-Ethnography	100	100	0
TOTAL PACIFIC	47,970	48,059	0.19
OSTEOLOGICAL COLLECTION	4,689	4,689	0
TOTAL	607,929	608,383	0.07%

CCUC, COLLECTIONS STATISTICS, 1993

ANTHROPOLOGY COLLECTION SCHOLARLY USE

USE OF ANTHROPOLOGY
COLLECTIONS BY LOAN

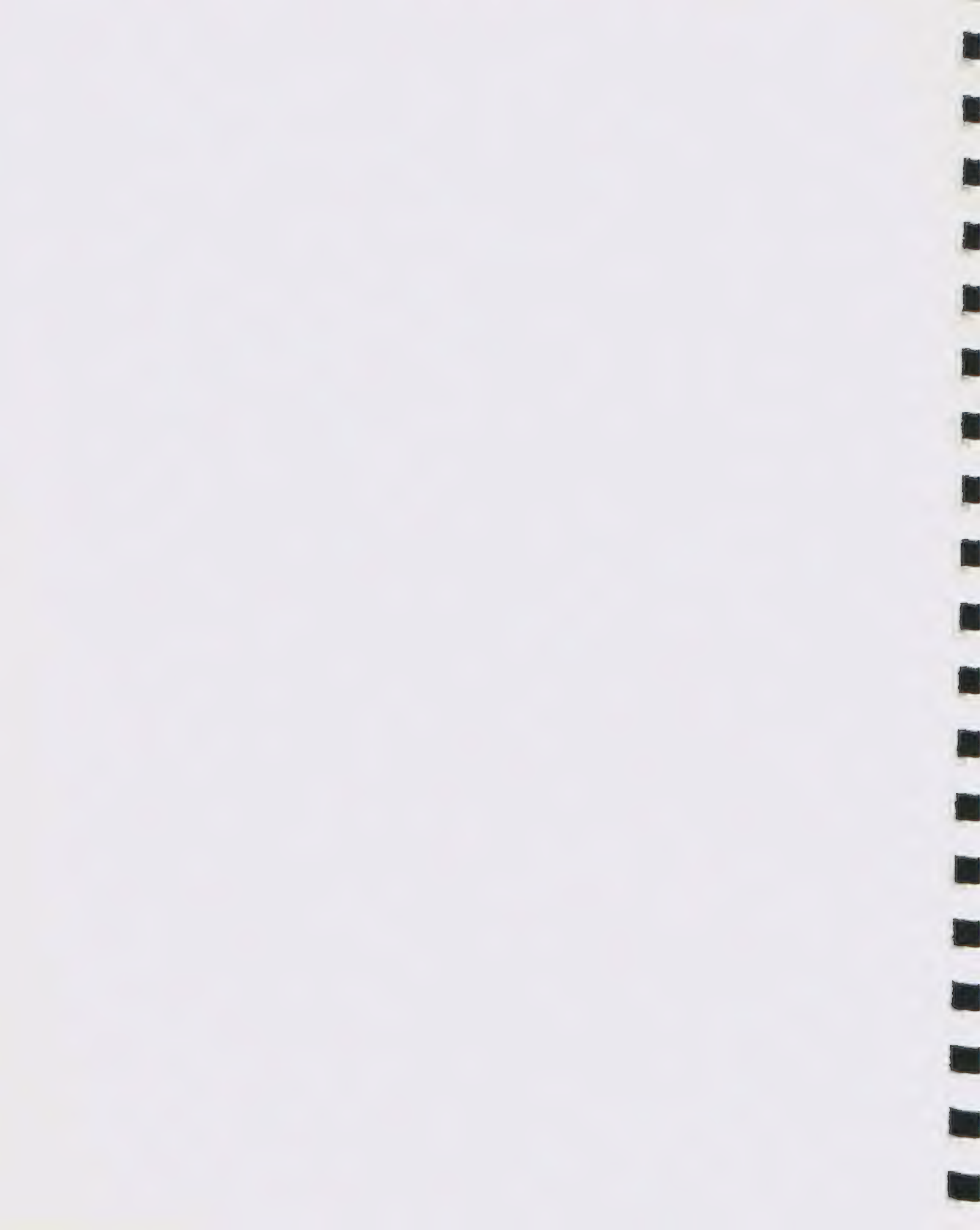
	Number of Loans	Number of Specimens Loaned	Number of Specimens Borrowed
Anthropology Collections	21	330	5

USE OF ANTHROPOLOGY
COLLECTIONS BY VISITORS

	Number of Professionals	Number of Students	Number of Others	Total Visitors
Anthropology Collections	131	56	135	322

Academic Affairs
Services





ACADEMIC AFFAIRS: SERVICES

COMPUTING

Computer Services is charged with supporting and coordinating diverse computer related activities at Field Museum. In the past year Computer services has continued to expand staff access to a broader range of network services both within the Museum and over the Internet. Two "gopher" information servers have also been installed to facilitate information exchange within the museum and the Internet community. In May James Koeppel resumed his duties as Computer Systems Manager having completed his work as Consortium Project Coordinator for a National Science Foundation sponsored project. Participating institutions included the American Museum of Natural History, Academy of Natural Sciences, Bernice P. Bishop Museum, California Academy of Sciences, Carnegie Museum of Natural History, Natural History Museum of Los Angeles County, Missouri Botanical Garden, New York Botanical Garden, Field Museum and National Museum of Natural History. Results of the project are embodied in the report entitled, "Analysis and Recommendations for Scientific Computing and Collections Information Management of Free-Standing Museums of Natural History and Botanical Gardens." The report contains much useful information that will be considered in developing an institutional computing plan for Field Museum.

The present computing environment at The Field Museum is as follows:

1. DEC VAX 11/785 running the Unix 5.3 operating system. This system is principally used for research and collection management activities. C/base, a commercial 4GL relational database software product is used to manage collection related information. It also serves as the main connection to internet services, particularly e-mail.
2. DEC DECsystem 5100 running the RISC Ultrix 4.3 operating system functions as the Museum's communication server. It routes mail to other museum systems and provides the full complement of internet services, including telnet and ftp. It supports TCP/IP, DECnet and Pathworks network protocols.
3. DEC Microvax 3100/20 runs the VMS 5.5 operating system and is a multi-user system and the platform for the Museum's Timeline financial operations. It is connected to the systems above by DECnet networking protocol.
4. DEC Microvax 3100/10 runs the VMS 5.5 operating system and, like the system above, runs VMS 5.5, but additionally is used as a server for PCs using PATHworks and the Raiser's Edge software from Blackbaud.
5. Sun Sparc system runs Solaris (Unix) 2.3 operating system. This is a new system that will be used principally as a "gopher" client/server in the Division of Fishes. It is connected to the Museum network for access to Internet and eventually to the Muse system used for managing Fishes collection data.

All five of these systems are linked through ethernet cables. The DECsystem 5100 by virtue of its facility to run three network protocols is the link that allows anyone connected to any of these systems to interconnect and use services on any of the other systems, provided they have proper permissions.

Separate from the systems described previously, but not connected to the network are the following:

1. AT&T 6386/25 WGS system running Unix 5.3, supporting Personnel and other administrative with C/base application software.
2. Museum Store systems supporting Retail sales uses the RSS Marketing software.
3. Museum attendance system uses custom application software with six client PCs and one network server running Novell 3.11.
4. MUSE system for collections management over a Novell 3.11 network for the Division of Fishes.
5. Design and production network running Novell 3.11 for AutoCad software to design new exhibits.
6. Multiple peer-to-peer LANS using LANtastic and Workgroup for Windows.

There are approximately 90 dumb ASCII terminals connected principally to the VAX 11/785 and Microvax 3100/20 systems. In addition, Field Museum has approximately 250 IBM (or compatible) PCs running a variety of software products including WordPerfect, Lotus 123, Excel, MS-Windows, JAVA, SYSTAT, SAS, Procomm Plus, and many others. We also have about two dozen Apple Macintosh systems for which we are beginning to develop support. The present staff of computing includes:

Computer System Manager: James W. Koepl, Ph.D. Biology (Systematics and Ecology, 1979). Duties include technical management of all institutional computing resources, including hardware and software and personnel. Also includes planning for future institutional information processing needs, assisting in negotiating licenses and contracts, representing the Museum on computer related issues and generally performing the lead technical role in helping the institution meet its short and long term goals and mission. He also endeavors to ensure security for all computer resources and affects delivery of all other computer service functions.

Computer Systems Specialist: Peter E. Lowther, Ph.D. Biology (Systematics and Ecology, 1979). Duties include data and database administration for museum systems. Provides system management, administration and network management, user support and training on Unix systems. Provides basic hardware and software support on PCs.

Computer Systems Specialist: Dahao Wang, M.S. Electrical Engineering 1993. Duties include low level support for PC hardware and software. Responds to user trouble reports, diagnoses problems, makes minor and major repairs of components, fills other requests as directed; provides assistance with user training and computer resources. Provides applications support for complex applications such as JAVA, AutoCad, Graphics software, LANs, Unix and C programming.

Computer Operations Specialist: Gregory Kotulski specialises in all functions related to administrative systems, particularly the two Microvaxes, and the Financial and Development software that run on them. Assists with PC hardware and software in other areas.

Computer Systems Intern: Karen Morris, Electrical Engineering Major. Duties are to assist Computer Services staff and provide basic software and hardware support as directed.

ACADEMIC AFFAIRS: SERVICES

LIBRARY

The Museum Library maintains and builds collections of books, journals and other special materials that are essential to the Museum's research, exhibition, and educational programs. The Library serves a number of different publics, each with distinct needs, and strives to balance the requirements of all users in order to provide the best possible service. In addition to the services provided to Museum staff, volunteers, interns, visiting scientists, specialists and consultants, Library collections are available to the international community of natural science researchers through the Interlibrary Loan Program. Library resources are also offered to the public at large through the Library's Public Reading Room.

The Friends of Field Museum Library made many contributions to Special Collections during the year and added several significant works to the Rare Book Collections through the Friends Fund. Of particular note is the purchase of a copy of Charles F. Millspaugh's Medicinal Plants, in the two volume edition published in Philadelphia by John C. Yorsten & Co. in 1892. This purchase rounds out the Library's collection of materials relating to this important work by Field Museum's first Curator of Botany.

The growth and organization of Field Museum's botanical collections under Millspaugh's care from 1893 until his death in 1923, made the Museum's Herbarium one of the finest in existence. Millspaugh's contributions to the Library were equally important. Among his many gifts were a bound volume containing his original watercolor illustrations for the Medicinal Plants, each accompanied by a proof copy of the lithograph plate; a package of galley proofs together with later, corrected proofs of portions of the text; and a bound set, in six volumes, of his final proof of the work. Millspaugh published his study in parts which were issued from 1884 to 1887 under the title American Medicinal Plants. The complete work includes 180 color plates.

LIBRARY ACQUISITIONS AND COLLECTION USE, SUMMARY TABLE, 1993

LIBRARY	HOLDINGS 2-31-92	BOOK ACQUISITIONS			SERLS RECVD	HOLDINGS 12-31-93	STAFF USE
		PUR CH.	EX CHG.	GIFT			
GENERAL	103,484	115	66	203	473	104,341	1,308
ANTHRO.	37,054	172	60	84	133	37,503	647
BOTANY	31,170	70	21	140	139	31,540	391
GEOLOGY	35,961	41	18	31	181	36,232	348
ZOOLOGY	36,390	118	35	196	129	36,868	431
BIRDS	11,511	26	6	26	21	11,590	107
MAMMALS	4,033	30	4	19	15	4,101	107
INSECTS	14,296	20	9	33	68	14,426	72
INVERTS	3,911	24	3	33	12	3,983	81
FISHES	1,022	4	8	10	8	1,052	31
REPTILES	1,617	14	5	75	5	1,716	33
TOTAL	244,059	516	200	654	1,055	246,484	3,125

ACADEMIC AFFAIRS: SERVICES

PHOTOGRAPHY

The Photography Department provides a full range of photographic services to the entire Field Museum staff, including all departments within Academic Affairs, Public Programs, Development and External Affairs, Museum Affairs, and Finance and Museum Services. It also makes its services and collections externally available to a diverse group of scholars, educational and research institutions, governmental granting agencies, scientific publishers, and commercial publishers.

The department is responsible for new photography, lab services, and for the photography collection. The photography collection maintains cataloguing, preservation, filing, and retrieval of negatives, slides, and transparencies. It also provides photo research to aid in accessing imagery. The collection currently holds over 500,000 images, and grows annually by an estimated 15,000. The photographic collection at FM contains the only comprehensive visual documentation of our scientific collections, research, field work, exhibits, and the history of the museum. Photographs in the collection range from the earliest field expeditions to the most current photographic images. Staff photographers produce new photography of objects in the studio, and photograph exhibits, events, activities, portraits, and the building and grounds. Lab services provide for film processing, printing, copying and duplicating. Common uses include publications, i.e., scientific research, promotional, marketing, development, editorial, and commercial. They are also used for presentations and reports, and exhibit display and research.

Internal Requests

The department serviced 1,062 in-house job requests in 1993. Our in-house black-and-white printing services, and color slide production were the major areas of production. Museum staff ordered 17,370 black-and-white prints, with over 12,000 of them produced in-house. They also ordered 13,014 color slides, with over 9,000 of them produced in-house. Over 200 assignments requiring new photography of people, places or objects were completed. Staff of the academic and scientific departments of the museum requested 7,152 B&W prints, and 3,658 slides, for publication and research.

Photography of the progress and openings of two new permanent exhibits Rautepupuke II: A Maori Meeting House, and Africa were completed. Documentation of the Life Over Time permanent exhibit progress continued, along with a variety of hall closings and deinstallations. The Public Relations Department requested 7,694 B&W prints, and 5,169 color slide duplicates for use in publicizing permanent, temporary, and traveling exhibits, as well as for publicizing lectures, performances, and demonstrations. New and existing photographs were also requested for exhibit display purposes in Rautepupuke II: A Maori Meeting House, Africa, and Life Over Time, and for a book publication on the Maori House project.

Several projects were completed for the Museum's special exhibit programs, including an AIDS exhibit, featuring the work of D. Doel Soejarto, Research Associate, Vascular Plants. Also completed were photographs for new reading rails surrounding the elephants in Stanley Field Hall. Other changes to Stanley Field Hall that were documented included the installation of *Brachiosaurus*, and the ten new permanent banners. Substantial time and resources were also devoted to several projects associated with the Centennial of the Museum. New and existing photography, and extensive photo research, was required for the following:

- "Images in Motion," shows one and two, approximately 30 minutes each, titled "Origins of the Earth/Egypt/Pacific" and "Africa," were projected across the exterior facade of the Museum. Each show ran for 10 days, the first in September, and the second in November.
- "Exploring the Earth and its People," produced by Commonwealth Edison, a 16-minute videotape highlighting history and the current activities of CEEB, CCUC and Exhibits.
- "The Natural History of the Field Museum," a book illustrated with over 200 historical and contemporary photographs.
- Women's Board Centennial Program Book, supported by sponsors, pages featured 44 historical photographs chosen from the collection and Museum archives.

- Centennial Resource Guide Book, for use by the Education Department's Centennial docent tour program, illustrated with 20 historical photographs from the collection.

Selected internal publications

- Photography for scientific publications by curators including Lance Grande, Curator of Fossil Fishes; Robert Welsh, Associate Curator, A.B. Lewis Research Project; James VanStone, Curator of North American Archaeology and Ethnology; Anna C. Roosevelt, Curator of Archaeology; Rüdiger Bieler, Assistant Curator and Head, Invertebrates; and Olivier Rieppel, Curator, Fossil Amphibians and Reptiles.
- Perspectives: 1993, and Perspectives Honor Roll of Donors, two companion brochures that are reports to donors, published by the Development Department.
- The Women's Board Calendar. Photography of objects from the Africa exhibit. This is also distributed to FM Members.
- In the Field, the bimonthly publication sent to FM Members.
- Images for 25 postcards requested by the Museum store.

Lightwell and move of the Photographic Collection

The final report to National Endowment for the Humanities was submitted in March of 1993 on the "Preservation of the Photographic Collection: Nitrate Copy Project" (Nina Cummings, Project Director). The three-year project produced 23,162 interpositive duplicates of the deteriorating nitrate negatives, 75 historical glass negatives, and a climate controlled area for the collection.

Work was completed on the Botany/Geology lightwell in 1993. Belding Construction Company was hired to move the entire photographic collection to the new storage room in the lightwell area. The HVAC system, used for climate control of the collections, was also reinstalled. The new 1,400 s.f. room is approximately 33% larger than the previous facilities. It will allow for the growth of the Photography Department's photographic collection for 5-10 years, and Botany Department's type photo-negative collection for 20 years.

External Requests, Sales, and Permissions

Payments were received for invoices totaling \$25,435 in 1993. These included some 1992 invoice payments. Paying requests for prints, slides and permissions came from 330 sources. Approximately 50 additional outside requests were returned uncompleted, due to internal request priorities. For-profit companies, such as Time-Life Books, Scientific American, and Harper Collins made up 183 requests. Non-profit companies and institutions, such as the Smithsonian, University of California, and the National Park Service made up 116 of the requests. The remaining requests came from individuals and through Webber Resource Center.

As the Field Museum celebrated its centennial year, other institutions celebrated the centennial of the World's Columbian Exposition. The department's first loan of original photographic material, three C.D. Arnold lantern slides were sent to the University Museum at Ann Arbor where they traveled to the Terra Museum of Art in Chicago for an exhibit, "The Fair View: Alternative Visions of the World's Columbian Exposition." The exhibit will return to Ann Arbor. Plans to make an exhibit catalogue available on the Internet are being discussed. Chicago Historical Society celebrated with their exhibit and catalogue "Grand Illusions: Chicago World's Fair," the catalogue includes two photographs from our collection. The Museum of Science and Industry, although not formed at the time of the original fair, presented "Building MSI: 1893 to the 21st Century." A two-story photo banner of the Field Columbian Museum interior graced the rotunda of MSI and four other related photographs from our collection are used in the exhibit.

Our largest income-generating request came from the Korean Consulate who requested new photography of 15 objects in the Anthropology Collection. The color photographs were used in an exhibit catalogue and corresponding poster/insert for "Expo 93" produced by Onyang Folk Museum. In conjunction with the Museum's Special Events Department, Avalanche Publishing (CA) published the 1994 wall calendar Prehistoric Visions: The Art of Charles R. Knight at Field Museum of Natural History.

Selected external publications

- Alfred A. Knopf Publisher, Special Edition The Illustrated Jurassic Park
- Citadelles and Mazelnod Publishers, Paris L'art Oceanien
- American Indian Art Magazine, cover photo, Winter 1993; article on Native American jewelry, Fall 1993 and one photo in the 1994 American Indian Art Magazine Calendar.
- Harry N. Abrams Inc. NY American Art Desk Diary 1994
- Kinki University Press, Japan Health Effects of Low Level Radiation

Selected External Video/Film

- KUSA-TV "How the West Was Lost" (Discovery Channel)
- "Indians of North America: The Seminole"
- "Paha Sapa: The Struggle for the Black Hills"
- WTTW-Chicago, "Africa: A View From The Field"
- Industrial Video for W.H. Miner Enterprises, Arends Advertising Producer

CD-ROM

- Microsoft Inc. "Dinosaurs"
- "The Theory of Plate Tectonics" TASA Graphics
- IBM Multimedia (pending release) "Biosphere 2: Life and Earth"

ACADEMIC AFFAIRS: SERVICES

SCIENTIFIC SUPPORT SERVICES: SCIENTIFIC ILLUSTRATION

The four scientific illustrators are Zorica Dabich, Marlene Hill Donnelly, Zbigniew Jastrzebski, and Clara Richardson-Simpson, supervised by John Engel (Botany). All are professional artists with a broad background in drawing and painting, and many years of experience in both art and natural history illustration. They are charged with production of illustrations of various subjects, fulfilling the need for visual description of research material. The diversity of research interests of the curatorial staff is reflected in the wide variety of specimens and artifacts illustrated. Virtually all illustrations are produced from actual objects of scientific study, and include descriptive visual presentations, complicated reconstructions of artifacts, skeletal structures and fossil plants and animals. The illustrations are used as an explanatory supplement to the research conducted by the curatorial staff, and appear in various publications, including Fieldiana.

Each of the scientific illustrators employs a broad range of techniques and media, and works with a diversity of subjects. However, each illustrator has refined particular techniques. For example, water color paintings and drawings utilizing crow quill are the specialties of Zorica Dabich; carbon dust, air brush, scratch board techniques, as well as line and stipple rendering are the specialties of Marlene Donnelly; Zbigniew Jastrzebski has special expertise with pencil or pen and ink stipple rendering. Clara Richardson-Simpson specializes in line and stipple representations and also continues to utilize an advanced Macintosh graphics system to prepare high quality illustrations, maps, tables, charts, etc., for educational and publication purposes.

SCIENTIFIC SUPPORT SERVICES: SCANNING ELECTRON MICROSCOPE

The Scanning Electron Microscope (SEM) is an invaluable resource for both original research observations and documentation of results by scientists in the Center for Evolutionary and Environmental Biology. It allows researchers to examine fine surface details of three-dimensional objects at magnifications ranging from 5x to 50,000x. Current research projects using the SEM range from various studies of the structure and biology of fossil and living plants to investigations of the structure of skulls and teeth of small mammals to examinations of snails and other gastropods. Other SEM projects include studies of the morphology of beetles, bryozoans, fungal spores, snake scales and fossil plants.

The Scanning Electron Microscope facility is a multi-user research area composed of an SEM and its ancillary equipment. Forty-four curators, professional staff, students, research associates, and visiting scientists in Center for Evolutionary and Environmental Biology employed the SEM in their research projects in 1993. Investigators from the Departments of Botany, Geology and Zoology obtained 1700 publishable SEM photographs. The Field Museum purchased a state-of-the-art AMRAY Scanning Electron Microscope in 1989 with the support of the National Science Foundation and the Elizabeth F. Cheney Foundation to replace the out-of-date SEM that had serviced the facility for almost twenty years.

Betty Strack, a part-time staff member, manages the SEM laboratory. Her duties include supervising the use of the SEM, maintaining detailed records of its use, and providing assistance to staff in their SEM projects. Betty also keeps the facility in good operating condition and performs routine maintenance on instruments.

ACADEMIC AFFAIRS: SERVICES

SCIENTIFIC SUPPORT SERVICES: BIOCHEMISTRY LABORATORIES

The Biochemistry Laboratories are a Field Museum research facility dedicated to using methods of molecular biology in the genetic study of organisms and their evolution. The genetic data contained in DNA sequences have become increasingly important in determining relationships among groups of species and their probable patterns of descent from common ancestors. Some uses of genetic data in environmental and evolutionary biology are: i) in biogeography, as in the determination of genetic relationships among groups of populations to be able to infer historical patterns of migration and settlement; ii) in determining evolutionary relationships between humans and other primates; iii) in endangered species propagation programs at zoological parks, as a tool to measure the genetic health of captive populations; and iv) in the study of extinct or endangered species from specimens in museum collections.

The Laboratories currently employ gene amplification technology (the Polymerase Chain Reaction or PCR) coupled with DNA sequencing as primary tools to obtain genetic data. These are sensitive methods that allow Museum scientists to extract and sequence DNA contained in museum specimens, including the small amounts of DNA that may still remain in skins, skeletal material, and dried herbaria specimens.

With the help of PCR and DNA sequencing technologies, a number of Field Museum scientists and students continue to generate data for their research. Scott M. Lanyon (Zoology) and John Flynn (Geology) are accumulating DNA sequence data from several genes of the mitochondrial genome in their respective studies of the blackbirds and related avian groups, and the Carnivora.

Sara Hoot, a Research Associate in Geology, received an NSF award in 1993 to continue her major project to investigate the phylogenetic relationships among the flowering plants in the Ranunculidae. In collaboration with Peter R. Crane, MacArthur Curator, Geology, Hoot has been sequencing two genes from the chloroplast genome (*rbcL* and *atpB*) and one gene from the nuclear genome, the 18S ribosomal RNA gene.

Elizabeth Pine, a former intern with Gregory Mueller (Botany Department), won the Westinghouse Science Talent Competition, largely on the strength of her work with Mueller in the Biochemistry Laboratories, and is now a student at Harvard University.

DNA sequencing projects are presently being conducted in the Labs by several graduate students. Tom Schulenberg and John Harshmann, both of the U. of Chicago and studying under Lanyon, are sequencing a portion of the mitochondrial cytochrome *b* in the Biochemistry Laboratories as part of their dissertation research in ornithology. Scott Steppan is investigating South American leaf-eared mice (genus *Phyllotis*) under the guidance of Bruce Patterson (Mammals) and is using DNA sequences in his analyses. Joe Walsh is working with Larry Heaney (Mammals) and is gathering DNA sequence data in his dissertation research, a biogeographic study of Philippine fruit bats. Several other graduate students are conducting preliminary or thesis related DNA sequencing projects.

In 1993 the Biochemistry Laboratories received a grant from the National Science Foundation to renovate its facilities. John G. Hall and Scott M. Lanyon are the project directors. The renovated laboratories will provide additional and more useful space for molecular systematics research. These labs are scheduled to be completed in late 1994.

Demand for the use the Biochemistry Laboratories for molecular systematics research by Field Museum staff and students has steadily increased since the PCR and DNA sequencing were introduced here in early 1990. The Laboratories' goals in the near future are to increase the rate and efficiency of DNA sequence data collection and thereby permit additional staff the opportunity to use its facilities in their research.

ACADEMIC AFFAIRS: SERVICES

SCIENTIFIC SUPPORT SERVICES: FIELD MUSEUM PRESS, 1993

Anthropology

No. 20. Material Culture of the Chilcotin Athapaskans of West Central British Columbia: Collections in the Field Museum of Natural History. By James W. VanStone; 1993. 29 pp., 25 illus. \$12.00 (Publ. 1446).

No. 21. Stress and Warfare Among the Kayenta Anasazi of the Thirteenth Century A.D. By Jonathan Haas and Winifred Creamer; 1993. 211 pp., 78 illus. \$32.00 (Publ. 1450).

Botany

No. 32. Pteridophyta of Peru. Part V. 18. Aspleniaceae—21. Polypodiaceae. By Rolla M. Tryon and Robert G. Stolze, with Blanca Leon; 1993. 190 pp., 14 illus. \$20.00 (Publ. 1442).

No. 33. Flora Costaricensis. Family #202—Rubiaceae. By William Burger and Charlotte M. Taylor (William Burger, series ed.); 1993. 333 pp., 66 illus. \$50.00 (Publ. 1454).

Geology

No. 26. Comparative Microscopic Dental Anatomy in the Petalodontida (Chondrichthyes, Elasmobranchii). By Rainer Zangerl, H. Frank Winter, and Michael C. Hansen; 1993. 43 pp., 35 illus. \$16.00 (Publ. 1445).

No. 27. Status of the Pachypleurosauroid *Psilotrachelosaurus teoplitschi* Nopcsa (Reptilia, Sauropterygia), from the Middle Triassic of Austria. By Olivier Rieppel; 1993. 17 pp., 9 illus. \$10.00 (Publ. 1448).

Zoology

No. 71. Seasonal Status, Relative Abundance, and Behavior of the Birds of Concepcion, Departamento Santa Cruz, Bolivia. By Susan E. Davis; 1993. 33 pp., 4 illus. \$13.00 (Publ. 1444).

No. 72. The Distribution and Ecology of Mammals on Leyte, Biliran, and Maripipi Islands, Philippines. By Eric A. Rickart, Lawrence R. Heaney, Paul D. Heideman, and Ruth C. B. Utzurrum; 1993. 62 pp., 18 illus. \$18.00 (Publ. 1449).

No. 73. Male External Genitalia of Non-Prehensile Tailed South American Monkeys. Part I. Subfamily Pitheciinae, Family Cebidae. By Philip Hershkovitz; 1993. 17 pp., 6 illus. \$13.00 (Publ. 1451).

No. 74. Intraspecific and Interspecific Variation in the *Cryptotis nigrescens* Species Complex of Small-Eared Shrews (Insectivora: Soricidae), with the Description of a New Species from Colombia. By Neal Woodman and Robert M. Timm; 1993. 30 pp., 19 illus. \$13.00 (Publ. 1452).

No. 75. A New Central Brazilian Genus and Species of Sigmodontine Rodent (Sigmodontinae) Transitional between Akodonts and Oryzomyines, with a Discussion of Muroid Molar Morphology and Evolution. By Philip Hershkovitz; 1993. 18 pp., 9 illus. \$13.00 (Publ. 1453).

ACADEMIC AFFAIRS: SERVICES

SCIENTIFIC SUPPORT SERVICES: SCHOLARSHIP COMMITTEE

The Field Museum encourages and supports the use of its collections and facilities by outside scholars and students. The Scholarship Committee is responsible for the review of applications and the disbursement of funds for visiting scientists, graduate fellows and undergraduate interns who wish to work with the museum's collections or collaborate with its scientists. The Scholarship Committee administers seven separate funds. These include the Borg-Warner Robert O. Bass Visiting Scientist Fund, the Rowley Fund, the Karl P. Schmidt Fund, the Thomas J. Dee Fellowship Fund, the Armour Fund, the Louer Fund, and the Undergraduate Internship Fund.

During the 1992-1993 period, the Scholarship Committee, chaired by Lance Grande, made awards to about 20 individuals in the four scientific departments. Of these awards, approximately 9 were given to exceptional graduate or undergraduate students who have demonstrated a strong commitment to the study of natural history. The remaining awards were given to scientists from around the world, including scholars from Argentina, Brazil, China, Colombia, England, Germany, Hungary, Madagascar, Peru, Russia, Spain, Uganda, as well as numerous scientists from the United States and Canada.

Scholarships and Internships Awarded in 1993

Borg-Warner Robert O. Bass Visiting Scientists (for the support of visiting scientists)

Gloria Arratia, Ph.D (USA), Chen De-Niu, Ph.D (China), Peter L. Forey, Ph.D. (UK), Rainer Hutterer, Ph.D. (Germany), Abundio Sagastegui Alva, Ph.D. (Peru), Isidoro Sánchez Vega, Ph.D. (Peru), Eugenia K. Sytchevskaya, Ph.D. (Russia).

Thomas J. Dee Fellows (for research and academic fellowships with priority given to younger, less well established research workers and to graduate students)

Lilian Paglarelli Bergqvist, Alfredo Carlini, András Demeter, Ph.D., Maria Silvia Ferrucci de Carrera, Rosa Garcia-Perea, George Edward Hooks III, Paula M. Mikkelsen, M. Lucien Marie Aimé Rakotozafy, Carlos Villarroel Ph.D., Kelly R. Zamudio.

Rose M. Louer Scholars (specifically for students from Illinois or students working on projects concerning Illinois natural history)

Harvey E. Ballard, Jr., Walter J. Sundberg

Karl P. Schmidt Scholars (for the training of young scientists who desire to study at the Field Museum)

Ethne Barnes, Ph.D., Robert M. Chandler, Luis A. Ruedas

Internships (work experience whereby an undergraduate or recent graduate gains hands-on training in his/her field of expertise for one or more semesters)

Roarke Donnelly, Ian Gordon, Elizabeth Pine, Todd Vision, Jamie Welling, Mary Wisz.

